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The Orchard.

For the Ohio Cultivator

The Fruit Business.

Peaches in the Miami Valley — Loveland and vicinity — Summer's schooling in the Fruit Trade — The secret of success — The Express Companies and their Responsibilities — Dishonorable subterfuges to which their Agents resort.

FRIEND HARRIS:—The peach season is drawing to a close. The production of the Little Miami Valley from Milford to Freeport, a distance of thirty-four miles by rail, or about twenty-five by air line, has been something like fifty thousand bushels.—Nearly all that have been shipped northeastward as far as Rochester, Syracuse, Toronto and Montreal, have come from this valley. Having been in the north-east during most of the season, I know whence come the shipments, and being engaged in the trade, my interest led me to notice every fact connected with the business.

By far the largest shipping point has been Loveland. In this vicinity more attention has been paid to fruit culture during the past five years, than in any other locality. In a short time this will be a great fruit mart, especially for pears, peaches and the small fruits. We have now the advantage of shippers at this point, obviating the necessity of sending to the city—Cincinnati—to be shipped at a distance. It has the advantage over the city, of shipping more immediately from the growers. The crops of grain have been usually good, (corn promising to be a little extra,) and with the fruit crop, our vicinity is considerably well off in a financial point of view.

The war times so wrenched down the small fruit market, that I was forced northward to get anything for my own production. Mr. E. Longley, of Phonetic and Phonographic memory, being also interested, purchased of our neighbors strawberries and cherries, which I sold in Cleveland and Buffalo. We were totally ignorant of the business, and, of course, were involved in much tribulation at times. We just saved ourselves on what we purchased, and got a fair price for our own production; but we learned that for which we would not take a considerable sum—capital in trade better than bank credit. Three months in the upper cities have constituted the most profitable part of my education.

As the peach season approached, Mr. L. was anxious to engage the orchards of this vicinity; but having nothing that I could lose in justice to those I owe, I backed out of the responsibility, and operated from Detroit to Toronto for Mr. L. The result is, that he has completed his education in this line with a fair return for his time, and I am not out of pocket for my tuition. So look out for future operations. Had we known at the outset what has been learned in the way of management, the result would have been decidedly advantageous in a pecuniary way.

Among other things, we have learned:

1. That success in the trade depends more upon those who gather the fruit, than upon anything else. There is a nick of time in which to pick and ship every variety of every kind of fruit. Careless gathering will ruin any shipper, unless he largely rejects what may be brought in an unsuitable condition; and when the ship-

pers are inexperienced, or are tempted by temporarily good prices abroad to accept fruit picked too green or too ripe, they are liable to be swamped. The growers, if they gather their own fruit, are legally bound to gather with all the care, regardless of expense, which the nature of the article requires, for shipping at any distance to which the fruit can be safely sent, provided they are informed of its destination.

2. That next to the gathering, the most depends upon the handling of the fruit by the Express Companies. They are legally bound to handle every article they undertake to carry, with all the care which its nature requires. In the light of this well understood principle of law, I undertake to say that all fruit which has been carried as far as Cleveland, Detroit, Buffalo, etc., has been damaged to the extent of fifty cents per drawer and box, on the average, by careless handling *in transitu*. The companies have in this way damaged the fruit dealers, including retailers in the northern cities, at least fifty thousand dollars this season. Their miserable recklessness of legal obligation, has forced the picking of much fruit so green that it would wither before ripening, and both shippers and retailers have lost heavily in consequence. Then when the fruit has been picked just ripe enough for Buffalo, if the companies would handle it properly, it has arrived so much bruised as to produce great loss—saying nothing about the gustatorial loss on the part of the consumers. I have been all over the north and along the way watching this outrage, and another year there must be a combination of shippers to force the companies to do their duty, or pay the damage fully assessed. It would cost a single operator, with little capital, more than he could stand to get justice from these or any other heavy companies. An illustration in my own case. A shipment of strawberries and cherries lay over at Columbus, in consequence of the delay of the train occasioned by taking a regiment of soldiers. Accordingly there came to me at Cleveland on Saturday, after the market was half spent, two shipments, on which I lost about forty dollars. The agent would not even *remit the freight bill* on the lot which they did not bring through according to contract. Various persons in the companies' employment at Cleveland had the impudence to declare the cause of delay to have been "an act of God" for which they were not responsible!! Shippers hereafter must not submit to such gross insult and damage. Another instance of subterfuge, involving an insult to the understanding of the shipper, occurred at Buffalo. A freight bill from Columbus was found to be as high as from Cincinnati, and on asking a reduction, the reply was, that "it takes just as much car room from Columbus, and we can't afford a less rate!" So he might have said it requires as much car room for ten miles, and therefore we must charge twelve shillings per hundred. Large companies should hold themselves above such shams, even if dealing with dunces. The agents have generally seemed glad to be informed of all neglect of duty on the part of the employees; and often have they encouraged a hope that fruit which had cost so much care to produce, and had been shipped with great confidence that it would arrive in a satisfactory condition, would be respected along the route thenceforth in careful handling. But as often has this hope been disappointed, and as the shipments increased the carelessness seemed redoubled.

3. In the third place, we have learned the liability of some persons to get crazy when prices are good, and to "pitch in" so largely as to swamp themselves and damage wealthy operators.

4. In addition to many other items too numerous to mention, we have learned that Uncle Sam's cart is "too slow a coach" for the fruit trade, and one should depend entirely upon lightning speed for certainty and dispatch.

And finally, no drawer for small fruit should hold more than half a bushel, and no peach box should contain over that quantity, nor be made without a partition.

The production of small fruit has become so extensive that none may hereafter hope for profit except by raising the finest and

largest varieties. Strawberries grown broadcast will pay nothing hereafter. Cultivation in hills to insure good size, is the only guaranty of success. Sour cherries are good for nothing for shipping. If sent north they are in advance of the time for that sort, and none but sweet varieties will pay at a distance of four hundred miles.

Pears are a fine fruit for shipping almost any distance, and always command profitable prices both to the grower and shipper.

L. A. HINE.

Loveland, Sept. 12, 1861.

For the Ohio Cultivator.

A Muskingum Co. Peach Orchard.

I was called upon recently to visit the orchard of N. F. Claypole of Muskingum Co., half a mile from his mill upon the Central Ohio Railroad, where he can ship fruit to Zanesville, Newark, Columbus and other places, without bruising. Look out, you who like fine peaches, when this orchard comes in full bearing, as Mr. C. will be able to furnish large supplies.

The orchard lies on a high hill, with a belt of growing timber on three sides; the land, which is a rather sandy soil, newly cleared for planting this orchard. It now contains 2,400 peach trees, one and two years from the nursery, planted 18 ft. each way in the row. The planting and cultivation is done by John Lynn, of which I can say it is decidedly the best specimen I ever saw. The land is cultivated in potatoes, melons and buckwheat. With the buckwheat the trees have made the best growth, with the darkest foliage. I noticed a small part of the orchard in grass, and was astonished to see the difference in favor of the cultivated trees. The trees were selected by T. S. Humrickhouse of Coshocton. It would pay any man who wants to plant a peach orchard right, to call and view this one of Claypole's, correctly done.

THOS. TIPTON.

Muskingum Co., Sept., 1861.

Many men spend their lives in gazing at their own shadows, and so dwindle away into shadows thereof.

Veterinary.

For the Ohio Cultivator.

Hoof-Bound Horses.

Contracted feet or hoof-bound, is an unnatural approximation of the heels, of the hoofs, and frequently of the quarters as well. We must first consider that a narrow foot is not necessarily a contracted foot. The Arabian horses, the Barbs, Scythians, and many thorough-breds, mules, and asses, have narrow feet, and with this frequently combined a white hoof, uniformly one of luxuriant, strong and tough fibre, high heels and concave soles.

Contraction may be general or partial, pure or mixed. The symptoms may appear too obvious to need description; in some instances it certainly is manifest enough, but not in all. One foot may be contracted, while its fellow presents a natural appearance; but when both feet are contracted, both alike in aspect and action, the question is, what sort of a foot ought such a horse by nature to possess?

There are breeds of horses predisposed to contraction; a good deal depends upon the country, the nature of the soil, the dryness or dampness of the situation wherein the animals happen to be bred, or brought up. Horses having light bodies, hoofs of an oblong description, strong luxuriant fibres, and which possess light and near the ground action, may be said to be predisposed to contracted feet; on the other hand, heavy horses, used by farmers, are subject to disease opposite to contraction,—hoof thin, of weak fibre, and flat,—are prone to disease, become pumiced, and the ground surface convexed.

In considering the cause of contraction, it will be necessary to premise an observation or two on the physiology of the foot. This organ is made for the purpose of supporting the weight of the body, and moving under it with spring enough to ward off concussion. Its structure enables its component parts to possess certain motions, one upon the other, causing expansion of the heels, during the imposition of weight, and the force of action upon. Retraction of the parts takes place

as soon as the weight or force of action ceases to be in operation. This yielding or expansion of the hoof acts as a spring to the animal's body, and it is contracted when deficient in its natural or supplied moisture, causing the hoof to shrink or contract within itself. The spread of the hoof is owing to the expansive property, and this is shown in the natural or unshod hoof, more especially in the outer than inner quarter. So long as there is nothing to prevent the function of expansion, there will be no contraction. We seldom see a contracted foot in the state of nature; but when the horse is shod, what happens? The faculty of expansibility of the hoof is impaired, the hoof can no longer expand to the same degree as before; a slow, gradual change takes place, the opened heels and expanded foot almost imperceptibly becomes contracted. We do not wish to infer that shoeing is the sole cause of contraction. Shoeing fails to bring about this end, when the expansive powers of the foot is powerful enough to overceme its counteracting influence.

Does pure contraction produce lameness? Lameness never sets in until inflammation has made its appearance. A horse lame in a contracted foot will manifest heat, showing that it is not the result of the contraction: contraction may have been present a long time, but the cause of lameness is the inflammation supervening upon the contraction. If we reflect upon the history of the case, the length of time of the contraction coming on by imperceptible degrees, and believing that the parts within the hoof have accommodated themselves to the contracted space, as well by absorption as by alteration of position, we do not suppose that lameness would be consecutive on the contraction. I do not think that the inflammation should be referable to the contraction, but by some concussion or contusion sustained by the narrow foot in action, to the production of which the contracted, unyielding, rigid condition of the hoof, may have contributed.

The contraction which does produce lameness, is contraction in combination with inflammation. I have dissected every contracted foot, where lameness has followed contraction, that I have been able to procure' and in every instance I have found the navicular joint diseased. The foot predisposed to navicular joint disease, is the strong, round, clubby foot, open at the heels, with a sound frog jutting prominently out between them, bounded at its sides by heels thick and indisposed to yield, and itself liable, from its very exposure, to become, in a warm stable, hard and dry and incompressible. Pressure upon such a frog must render it, in effect, a fixture; it cannot expand; and at the time when pressure from below would force it upwards, weight from above is, with more or less violence, descending upon it.

Under these circumstances, can we wonder that the delicate lining of the navicular joint should become injured? It may be said, why is not the same difficulty experienced in the same foot? We answer by saying, that the fore feet are liable to many diseases to which the hind are hardly, if at all, obnoxious, and navicular disease constitute the most important ailment in the catalogue; but the weight of the head, neck, and half the body, upon the fore feet, may account for this, also concussion.

But there is a disease, or one precisely analogous to it, occurs in the hind as well as the fore limbs, though not in the foot, but in the hock joint. Articular spavin consists in the same pathological lesion as does inflammation of the navicular joint. It is not strange that the hind feet should not exhibit the same difficulty as the fore. Consider the difference of function in progression performed by the fore and hind limbs. The navicular bone, situated as it is behind the coffin bone, forming the nethermost joint in the column,—the last to receive the shock from above, the first from below, and the hock in the hind limb,—is the joint expected to fail, it being situated so as to receive the shock, which, in the fore limb, descends down the column, but as likewise to sustain the weight of the body at the time force is employed in their impulsion onward, even while in a state of motion; and why the coffin does not suffer as well as the navicular, cannot satisfactorily be accounted for;

it is in fact a part rarely diseased.

Zanesville, O. T. WEBB, V. S.

For the Ohio Cultivator.

Diseases of the Horses' Foot.

Little complaint is made of disease of the feet in other animals, but we are continually advised of horses being lame in their feet. How are we to account for this?

First, we must consider the habits or usages of the domesticated animals, and consider that a vital orgasm (as vascular as the brain) similar to a machine of human invention, wears out and becomes liable to disorder, according to the use made of it.

The horse is an animal of action and of speed, and lies down less than any other animal that puts his feet to continual trial. His trot is hard, gallops hard, his leaps are high and precipitous, straining every nerve and sinew when racing. Adding to these, he is frequently called upon to perform these feats on a hard and rough road, unyielding to a degree, causing concussion and battering of the hoofs, the hoofs being found insufficient protection against such roads.

Art has introduced the employment of horse shoes, causing a prolific source of lameness in horses.

There need not be any surprise felt, when we consider the intricate mechanism of the interior part of the foot; the functions of its several parts are liable to be interfered with and obstructed; the tissues are frequently mechanically injured by the force of action on hard roads. The foot is obnoxious to disease, owing to being seated in tissues differing from any other part of the body; the laminæ of the foot are of texture and function unlike other parts; the coronet also has its peculiarities, also the sensitive sole, and frog, and even the coffin-bone itself.

The disease I am about to treat of is, Acute Laminitis, (commonly called Founder.) Were I asked, from what disease the horse experiences the most suffering, I should answer, Laminitis or inflammation of the Laminæ of the feet. Still, there are other conditions wherein the animal suffers most acutely, for a time, but there is no one where the pain is so great or apt to be so protacted as the disease of so called founder. We need not be surprised at this, when we consider that the diseased parts are peculiar and sensitive in their nature, placed under peculiar conditions and situated between two unyielding bodies, the hoof without and the coffin-bone within, so that when the inflammation takes place, the opposition of these unyielding bodies, and consequent pressure of nerves highly sensitive as they now are, produces pain in the extreme, and this extreme pain, together with the situation in which it is felt, gives rise to symptoms distressing and singularly characteristic.

The approach of the disease is not sudden; a horse after a hard drive, or trying feat, will stand in the stable sometime before founder is discovered, and we account for it in this wise—exercise augments the circulation of the blood through the feet, whilst rest proves unfavourable to it; so that after great exertion over hard roads, the planter vessels become over-charged to such a degree, that the veins are incapable when at rest, of relieving the extreme radicals of the arteries and veins, hence congestion followed by inflammations,

The symptoms of the disease are such as cannot be mistaken. The horse presents himself in great misery, panting and breathing hard from the pain he is enduring. The aspect and position is striking, the hind feet advanced under the body (that is supposing the disease to be in the fore feet alone) that he may relieve the painful fore feet from the superincumbent weight; if forced to move forward he will shuffle his hind feet further underneath him, and step very lightly upon his heels, or else make a sort of leap forward. One would think that lying down would afford relief to the poor sufferer, but I have known horses in the greatest state of suffering, stand pawing and scraping day and night. The inflammation is so intense, that the heat can be felt through the hoofs; the vessels which supply the inflamed part with blood, are under inflammatory action, in a state of fullness, and pulsate violently under the pressure of the fingers. The pain altogether, is of the most distressing character,

disordering the system so much that symptomatic fever is the inevitable consequence, causing the animal to become alarmingly sick, much excited, anxious look, hot all over, and frequently sweating through the agony he is in. The mouth is parched, breath hot, respiration short, hurried and painful; pulse 70 or 80; parts of the body in a state of tremor; his countenance imploringly asking for relief.

Drinking cold water while heated, over loading or gorging the stomach, will also produce inflammation of the feet; for such is the sympathy between the stomach, intestines, and the cutaneous surface, that if we acknowledge the hoofs as being a continuation of the common skin, this is not to be wondered at. In studying the course and termination of this disease, we are satisfied that all the soft tissues of the foot are effected more or less, also the coffin-bone which is perforated in every part for the passage of blood vessels, likewise partake of the inflammatory action.

In this disease it is of the utmost consequence that our treatment should be prompt and energetic to check or subdue it at once; in doing this, a great deal depends on the condition we find the horse in, in general. The first thing necessary to be done is to remove the shoes, to relieve the feet from all constraint; Should the shoes be heavy, replace with light shoes, tacking them on with four nails without clinching. This releases the foot from compression.

Pare the cleft of the frog and introduce frog setons, bleed copiously from the jugular veins, envelope the feet in large warm bran poultices, carefully clothe him, give a large dose of physic, feed on bran mashes. Give chilled water, and in forty-eight hours the physic will be working, the setons discharging, and the horse on the road to recovery.

Much may be said for and against this mode of treatment, but I am bound by my own practice to declare myself in favour of it; it has in the worst of cases worked wonders, and therefore I have every reason to be pleased with it. But should the disease continue to advance and the pain continue very great, immerse the feet in hot water, and persist in the application of poultices or any other means to encourage the discharge of the setons; and give a couple of drachms of solid opium, once or twice in the course of twenty-four hours, as the case may require; do not fear the amount, for you know not what enormous doses a horse can take, while suffering from inflammation of the feet.

T. Webb, V. S.

Zanesville, Oct. 1861.

For the Ohio Cultivator.

Cattle Disease in Hamilton Co.

In this part of Hamilton Co. we have a disease at the present time prevailing considerably amongst cattle, and which is here called black tongue; they are taken—cows and cattle—with a stiffness in the legs, an apparent extreme tenderness or soreness of the feet; so that upon stepping they act as though they were moving amongst hot embers; their mouths become very sore, tongue stiff so that they do not use it to lick; tongue and teeth black; tears run out at the corners of the eyes, they lay round apart from the other cattle and eat little or nothing; and I have been told this disease has proved fatal in several cases at no very great distance from where I write.

These are the symptoms as described by neighbors who have witnessed it: in my own experience an ox was taken about 3 weeks ago with the lameness and extreme tenderness of foot, the shedding of tears and laying round; we bled him in the neck, swabbed his mouth with fish brine; his tongue was not black but dark colored; the teeth were not black; this ox's tongue did not get stiff but he used it freely to lick all the time; he has got well; his mate is now laboring under the same symptoms, tongue however is a good healthy color and he freely uses it; I went out this morning to swab his mouth, but from the appearance of his mouth and tongue contented myself with washing his feet with fish brine.

An intelligent German tells me they have the disease in Germany that they use the fish brine to wash both feet and mouth two or three times a day.

My ox that was first taken I pronounced to be foundered and upon referring to "Youatt on Cattle" I could neither find Founder or Black tongue. H. B.

Preston, Sept. 14, 1861.

Entomology.

The Army Worm.

BY J. KIRKPATRICK, CLEVELAND, O.

[We have been looking for the learned Bugologists to give the world a compact little essay upon the Army Worm, which has been so destructive in many parts of this country the past season. Several persons have essayed to treat upon the subject, chief of whom are Mr. Thomas of Ill., Kirkpatrick of Cleveland, and Dr. Fitch of N. Y. The two first named gentlemen have had field experience with their subject, while the last has seen it from afar. Mr. Kirkpatrick has furnished a paper on this subject for the forthcoming Ohio Ag. Report, which, though not written with the method and perspicuity most desirable in a scientific paper, contains the most available matter for our present purpose. Without following the exact arrangement of the author, we propose to dish up the essay in two chapters: first, of the history and description of the worm, and second, of remedies proposed, Secretary Klippart having kindly placed the advance sheets at our disposal.—ED. *Field Notes.*

Although the army worm has been long known to southern and western farmers, from the injury committed by it on various field crops—grains and grasses—yet, from some cause, it has not received that attention from scientific men which the importance and amount of its ravages demanded. All that was known of it was, that an insect of that name suddenly appeared in some locality not previously visited by it, or at least for many years, and laid waste the meadows or fields of grain around. In numbers it equaled the dreaded locusts of the east, and its serried battalions, advancing in regular ranks, swept bare the fields, leaving nothing but desolation where but a day before there were smiling harvests. In Kentucky and the more southern States its appearance was more regular than farther north, and its ravages were more dreaded, and it seldom appeared in great numbers in the great wheat regions. In the eastern States, as well as in the northwest and Canada, it was unknown. But in nearly all the regions mentioned, this insect has, in all probability, occurred regularly, and may now be found, not in the immense numbers in which they attract attention, but as isolated individuals. The present season seems to be peculiarly favorable to their increase, for they have appeared in all, or nearly all, the western, and also in some of the eastern and middle States, in such numbers as to attract the attention of the public, from their destruction of meadow grass, wheat, oats, corn, &c. It would be much within the mark to say, that the loss to the country for the present year, from this cause, amounts to many hundred thousand dollars, and consequently it is of great importance to examine into their history and the conditions under which they usually appear, so that means may be taken to put a stop to their ravages, if possible.

In 1855, I first had an opportunity to examine the army worm, having discovered it on the Cuyahoga flats near Cleveland, in June of that year. At that time I did not know the caterpillars observed bore that name, nothing being on record of its appearance in the northern part of our State, and the parent moth had never been identified, no one knowing, at least among the writers, anything about it. To be sure, Say, in his letters to C. W. Capers, had described the moth of the cotton army worm under the name of *Noctua Xylina*, and Harris, in his "Insects Injurious to Vegetation," has added to our knowledge of that insect the color of the caterpillars: but this differs materially from that of our army worm, and can, by no means, apply to it, although there is less difference in the colors of the parent moths. Both insects belong, however, to the same family. The moths have considerable resemblance, and the caterpillars have the same number of legs, though differing in color, the cotton army worm being the handsomest, as it is of a bright green, with black stripes and spots: in destructive ability they are about equal. On page 246 of the Ohio Agricultural Report for 1855, I described the army worm and its transformation, as far as then known to me.

The present season has proved very favorable for making a close examination of the habits of the army worm, owing to its appearance under nearly uniform conditions in so many different parts of the country. In the region lying south of 40 deg. north latitude, these caterpillars were observed two to four weeks earlier than in the lands lying north of that line. This was, of course, modified considerably by local circumstances; but they had come and gone in the

counties bordering on the Ohio river nearly four weeks prior to their being observed on the southern shore of Lake Erie. This may be partly explained by the earlier seasons of the southern counties, but not entirely, for in those counties the worm appeared soon enough to destroy part of the wheat crop, while in the north it did not appear until after that crop was entirely secured. So far north as Sidney, Shelby county, the caterpillars entered the ground, and changed to a pupa on the 16th of June. On the 7th of July the moth appeared. In Cuyahoga county the worms were not observed until about the first of August, and now (the 6th) they are undergoing their pupa transformation, and, as it will take not less than fourteen days to change to the perfect moth, there will be a difference of at least six weeks in the time of the departure as well as appearance of this insect in two counties, the centres of which are but 125 miles apart, and one less than 80 miles south of the other. In the northern, or lake counties, army worms were usually first observed in oat fields, and, as far as I had an opportunity to observe, in such as had a rather moist soil. In no case did they appear on dry upland, unless there was a moist spot somewhere in or near the field, and from this spot they seem to have traveled in all directions where food was attainable, unless hindered by some deep ditch, clear water, or a well-traveled road, and even in this latter case thousands would endeavor to cross, many succeeding.

Of the early history of the caterpillar we know little, for it seems never to have been observed until it had attained considerable size, and the individuals had spread over the field, making their ravages apparent. The smallest seen by me were about three-quarters of an inch in length. The parent moth deposits her eggs—and she has several hundreds of them—among fresh herbage of a kind suitable to the wants of her offspring. The young succulent leaves of the oats proved just such as were wanted, and to such her instinct led her; their natural habitat is probably the wild grasses of our swamps, but this cultivated herbage is much better and far more abundant. These eggs are probably placed on the underside of the leaves, and in clusters, where they remain until hatched. In such a position the young obtain abundance of food, and are protected from the hot sun by the cool green leaves. While small they can eat but little, and consequently the damage done is not apparent. In a short time, however, they become large and their voracity increases; the herbage among which they were bred is all devoured, and hunger drives them forth in search of new pastures. Spreading in every direction they eat as they go; in front there are waving fields of green, behind a tract of desert as clean swept as if burnt, unless weeds had previously usurped the place of the crop, and these are usually left standing memorials of poor farming.

The army worm is an epicure, and therefore unlike the grasshopper and locust. When in moderate numbers they are more choice in the selection of their food than they can be where the fields are overrun by their hordes; then they select the tenderest blade of some favorite grass or grain, leaving the midrib of the leaf untouched, but when, in the "struggle for life," each has to do the best it can for subsistence, nearly all grasses or grains come alike welcome, and all but the hard stems are devoured. In the oat field all the blades are eaten and the caterpillar ascends the stalk to the very top, and finishes by biting off nearly all the grains and letting them fall to the ground. As they do not eat the grain, this may be looked upon as wanton destruction. We learn that in the wheat and other grain fields, they often cut off the ears and let them fall to the ground. The only cause for this seems to be that they eat a portion of the finer parts of the peduncle or stalk. If the grain is cut previous to the worm leaving the field, and left out to dry, the insects will still continue feeding on the cut grain, and thousands may be found during the heat of the day, sheltered beneath the swath or bundles, so that it becomes necessary to remove the grain as soon as possible after cutting.

The resting time of the army worm is during mid-day. Their feeding time, morning, evening and night, and at these times they also travel. When resting they are usually coiled up in circle or snake fashion. When traveling they move at a moderate pace, avoiding all steep places if possible, and prefering level land. They can climb well enough if the ground is firm or covered with herbage, but if loose and friable they loose their footing, and fall back while endeavoring to climb any steep ridge. When arrived at their full growth they enter the ground to the depth of an inch or more, or burrow beneath some fence rail, old log, or loose turf, and there form an oval cell by rolling their bodies around several times, the sides of the cell being probably slightly

consolidated by some secretion of the caterpillar, but the walls are always friable and easily broken. In a day or two they cast their skins and become a light brown pupa that becomes darker in a few days, and is finally of a deep mahogany brown color, and in this condition is quite inert, unless handled, when they will jerk about violently. In this state they do no harm, as they cannot eat. While in the caterpillar state the army worm casts its skin often, and slightly changes its color, being nearly black when young, and much lighter when full grown. In from 14 to 20 days (14 with me), the pupa bursts its bonds and comes forth a light brownish moth, a decided night-flier. The males seek their mates, and after copulation the females select a spot for the deposition of their eggs.

It is not positively known how many broods of army worms there are in a year, but there is no doubt that there is at least two, for the moths hatched in midsummer deposit their eggs immediately after, and the last brood must remain either in the caterpillar or pupa state throughout the winter. It is somewhat remarkable that with the exception of a single specimen, all the moths hatched by me or received by others in different parts of the State, have been males. May not this suggest to the mind of the scientific reader a possibility of the undue increase of this species, as well as many others of the Noctuidæ, being the result, in some way, of parthenogenesis. Such sudden increase of insect life has never been satisfactorily explained, and it is doubtful if this would do it, but it would explain the disproportion of the sexes in the summer broods, if the unfecundated eggs of the female moth, like those of the queen bee, would produce males only. I throw this out merely as a suggestion.

The family of moths—*Noctuidæ* — to which the army worm belongs, contains a great number of injurious insects, in fact all are vegetable feeders; but a portion content themselves with weeds and the leaves of trees and shrubs, many of them being of no economical value. Among those that are remarkable for their injurious habits are the spindle worms of the corns—*Gortyna zeæ*, which is also so hurtful to dahlias, burrowing in their stems in the same manner as with corn. The cut-worms of the corn, cabbage, etc. —*Agrotis* ——; of these there are many species, the transformations of which have never been described.

It is remarkable that many species of this family appears in immense numbers suddenly, like our army worm, and lay bare the fields, but nearly all the European species that do so are like the cut worms, stem and root eaters. The *Mamestra brassicæ* proves highly destructive to the cabbage, turnip, lettuce, rape and even Indian corn. In France it prefers the cauliflowers, although it will eat almost every garden plant We have several species of the same genus, one of which may be often found on corn.

The caterpillar of the army worm moth when fully grown, measures from one and three-fourths to two inches in length, when well fed the latter, and is about as thick as a goose quill; color a lighter or darker grey; two lateral stripes, the upper with a yellowish central line, the lower a reddish one; legs, sixteen, six true or pectoral, eight prolegs or abdominal, and two anal, at the extremity of the body; the head brownish, sometimes marbled, and shining; a few short hairs on the body and longer straggling ones on the head. The pupa is of a mahogany brown color, nine lines in length, and tipped at the end with a short spine. The imago or perfect insect is a moth, the *Leucania extranea*, Guence, and unknown to American entomogists until this year. (I am indebted to Dr. Morris, of Baltimore, for the identification of this insect,) Head and thorax pale grayish brown, abdomen with deeper shade of gray, and with a tuft at the end, in the male. (I have no specimen that I am positive is a female, but one that may be one, has also a small tuft.)—Antennæ simple, scaly above, pubescent beneath, palpi moderate; first joint, horizontal; second, erect; terminal, bent forward, the last naked at the extremity, the others densely scaled and hairy; tongue of moderate length; eyes, naked, dark brown; legs, pale brown, with longitudinal spots of blackish. Anterior wings pale grayish brown, rather lighter beneath; above, sprinkled with minute blackish spots, an oblique fuscous streak from the apex, and a small silvery white spot near the centre of the wing; cilia, grayish brown, speckled with blackish; posterior wings like the anterior, but of a darker tint, especially near the posterior margin, cilia pale, almost white, scales of the wings lustrous like satin. There is a slight crest on the thorax, not more than might be called a dorsal ridge. On the under side of the posterior wings there is a fuscous spot near the middle and a row of minute spots forming a line of the same at the posterior margin; also, another row between that and the central spot: between these two rows the color is slightly yellow-

pers are inexperienced, or are tempted by temporarily good prices abroad to accept fruit picked too green or too ripe, they are liable to be swamped. The growers, if they gather their own fruit, are legally bound to gather with all the care, regardless of expense, which the nature of the article requires, for shipping at any distance to which the fruit can be safely sent, provided they are informed of its destination.

2. That next to the gathering, the most depends upon the handling of the fruit by the Express Companies. They are legally bound to handle every article they undertake to carry, with all the care which its nature requires. In the light of this well understood principle of law, I undertake to say that all fruit which has been carried as far as Cleveland, Detroit, Buffalo, etc., has been damaged to the extent of fifty cents per drawer and box, on the average, by careless handling *in transitu*. The companies have in this way damaged the fruit dealers, including retailers in the northern cities, at least fifty thousand dollars this season. Their miserable recklessness of legal obligation, has forced the picking of much fruit so green that it would wither before ripening, and both shippers and retailers have lost heavily in consequence. Then when the fruit has been picked just ripe enough for Buffalo, if the companies would handle it properly, it has arrived so much bruised as to produce great loss—saying nothing about the gustatorial loss on the part of the consumers. I have been all over the north and along the way watching this outrage, and another year there must be a combination of shippers to force the companies to do their duty, or pay the damage fully assessed. It would cost a single operator, with little capital, more than he could stand to get justice from these or any other heavy companies. An illustration in my own case. A shipment of strawberries and cherries lay over at Columbus, in consequence of the delay of the train occasioned by taking a regiment of soldiers. Accordingly there came to me at Cleveland on Saturday, after the market was half spent, two shipments, on which I lost about forty dollars. The agent would not even *remit the freight bill* on the lot which they did not bring through according to contract. Various persons in the companies' employment at Cleveland had the impudence to declare the cause of delay to have been "an act of God" for which they were not responsible!! Shippers hereafter must not submit to such gross insult and damage. Another instance of subterfuge, involving an insult to the understanding of the shipper, occurred at Buffalo. A freight bill from Columbus was found to be as high as from Cincinnati, and on asking a reduction, the reply was, that "it takes just as much car room from Columbus, and we can't afford a less rate!" So he might have said it requires as much car room for ten miles, and therefore we must charge twelve shillings per hundred. Large companies should hold themselves above such shams, even if dealing with dunces. The agents have generally seemed glad to be informed of all neglect of duty on the part of the employees; and often have they encouraged a hope that fruit which had cost so much care to produce, and had been shipped with great confidence that it would arrive in a satisfactory condition, would be respected along the route thenceforth in careful handling. But as often has this hope been disappointed, and as the shipments increased the carelessness seemed redoubled.

3. In the third place, we have learned the liability of some persons to get crazy when prices are good, and to "pitch in" so largely as to swamp themselves and damage wealthy operators.

4. In addition to many other items too numerous to mention, we have learned that Uncle Sam's cart is "too slow a coach" for the fruit trade, and one should depend entirely upon lightning speed for certainty and dispatch.

And finally, no drawer for small fruit should hold more than half a bushel, and no peach box should contain over that quantity, nor be made without a partition.

The production of small fruit has become so extensive that none may hereafter hope for profit except by raising the finest and

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largest varieties. Strawberries grown broadcast will pay nothing hereafter. Cultivation in hills to insure good size, is the only guaranty of success. Sour cherries are good for nothing for shipping. If sent north they are in advance of the time for that sort, and none but sweet varieties will pay at a distance of four hundred miles.

Pears are a fine fruit for shipping almost any distance, and always command profitable prices both to the grower and shipper.

L. A. HINE.

Loveland, Sept. 12, 1861.

For the Ohio Cultivator.

A Muskingum Co. Peach Orchard.

I was called upon recently to visit the orchard of N. F. Claypole of Muskingum Co., half a mile from his mill upon the Central Ohio Railroad, where he can ship fruit to Zanesville, Newark, Columbus and other places, without bruising. Look out, you who like fine peaches, when this orchard comes in full bearing, as Mr. C. will be able to furnish large supplies.

The orchard lies on a high hill, with a belt of growing timber on three sides; the land, which is a rather sandy soil, newly cleared for planting this orchard. It now contains 2,400 peach trees, one and two years from the nursery, planted 18 ft. each way in the row. The planting and cultivation is done by John Lynn, of which I can say it is decidedly the best specimen I ever saw. The land is cultivated in potatoes, melons and buckwheat. With the buckwheat the trees have made the best growth, with the darkest foliage. I noticed a small part of the orchard in grass, and was astonished to see the difference in favor of the cultivated trees. The trees were selected by T. S. Humrickhouse of Coshocton. It would pay any man who wants to plant a peach orchard right, to call and view this one of Claypole's, correctly done.

THOS. TIPTON.

Muskingum Co., Sept., 1861.

Many men spend their lives in gazing at their own shadows, and so dwindle away into shadows thereof.

Veterinary.

For the Ohio Cultivator.

Hoof-Bound Horses.

Contracted feet or hoof-bound, is an unnatural approximation of the heels, of the hoofs, and frequently of the quarters as well. We must first consider that a narrow foot is not necessarily a contracted foot. The Arabian horses, the Barbs, Scythians, and many thorough-breds, mules, and asses, have narrow feet, and with this frequently combined a white hoof, uniformly one of luxuriant, strong and tough fibre, high heels and concave soles.

Contraction may be general or partial, pure or mixed. The symptoms may appear too obvious to need description; in some instances it certainly is manifest enough, but not in all. One foot may be contracted, while its fellow presents a natural appearance; but when both feet are contracted, both alike in aspect and action, the question is, what sort of a foot ought such a horse by nature to possess?

There are breeds of horses predisposed to contraction; a good deal depends upon the country, the nature of the soil, the dryness or dampness of the situation wherein the animals happen to be bred, or brought up. Horses having light bodies, hoofs of an oblong description, strong luxuriant fibres, and which possess light and near the ground action, may be said to be predisposed to contracted feet; on the other hand, heavy horses, used by farmers, are subject to disease opposite to contraction,—hoof thin, of weak fibre, and flat,—are prone to disease, become pumiced, and the ground surface convexed.

In considering the cause of contraction, it will be necessary to premise an observation or two on the physiology of the foot. This organ is made for the purpose of supporting the weight of the body, and moving under it with spring enough to ward off concussion. Its structure enables its component parts to possess certain motions, one upon the other, causing expansion of the heels, during the imposition of weight, and the force of action upon. Retraction of the parts takes place

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as soon as the weight or force of action ceases to be in operation. This yielding or expansion of the hoof acts as a spring to the animal's body, and it is contracted when deficient in its natural or supplied moisture, causing the hoof to shrink or contract within itself. The spread of the hoof is owing to the expansive property, and this is shown in the natural or unshod hoof, more especially in the outer than inner quarter. So long as there is nothing to prevent the function of expansion, there will be no contraction. We seldom see a contracted foot in the state of nature; but when the horse is shod, what happens? The faculty of expansibility of the hoof is impaired, the hoof can no longer expand to the same degree as before; a slow, gradual change takes place, the opened heels and expanded foot almost imperceptibly becomes contracted. We do not wish to infer that shoeing is the sole cause of contraction. Shoeing fails to bring about this end, when the expansive powers of the foot is powerful enough to overceme its counteracting influence.

Does pure contraction produce lameness? Lameness never sets in until inflammation has made its appearance. A horse lame in a contracted foot will manifest heat, showing that it is not the result of the contraction: contraction may have been present a long time, but the cause of lameness is the inflammation supervening upon the contraction. If we reflect upon the history of the case, the length of time of the contraction coming on by imperceptible degrees, and believing that the parts within the hoof have accommodated themselves to the contracted space, as well by absorption as by alteration of position, we do not suppose that lameness would be consecutive on the contraction. I do not think that the inflammation should be referable to the contraction, but by some concussion or contusion sustained by the narrow foot in action, to the production of which the contracted, unyielding, rigid condition of the hoof, may have contributed.

The contraction which does produce lameness, is contraction in combination with inflammation. I have dissected every contracted foot, where lameness has followed contraction, that I have been able to procure' and in every instance I have found the navicular joint diseased. The foot predisposed to navicular joint disease, is the strong, round, clubby foot, open at the heels, with a sound frog jutting prominently out between them, bounded at its sides by heels thick and indisposed to yield, and itself liable, from its very exposure, to become, in a warm stable, hard and dry and incompressible. Pressure upon such a frog must render it, in effect, a fixture; it cannot expand; and at the time when pressure from below would force it upwards, weight from above is, with more or less violence, descending upon it.

Under these circumstances, can we wonder that the delicate lining of the navicular joint should become injured? It may be said, why is not the same difficulty experienced in the same foot? We answer by saying, that the fore feet are liable to many diseases to which the hind are hardly, if at all, obnoxious, and navicular disease constitute the most important ailment in the catalogue; but the weight of the head, neck, and half the body, upon the fore feet, may account for this, also concussion.

But there is a disease, or one precisely analogous to it, occurs in the hind as well as the fore limbs, though not in the foot, but in the hock joint. Articular spavin consists in the same pathological lesion as does inflammation of the navicular joint. It is not strange that the hind feet should not exhibit the same difficulty as the fore. Consider the difference of function in progression performed by the fore and hind limbs. The navicular bone, situated as it is behind the coffin bone, forming the nethermost joint in the column,—the last to receive the shock from above, the first from below, and the hock in the hind limb,—is the joint expected to fail, it being situated so as to receive the shock, which, in the fore limb, descends down the column, but as likewise to sustain the weight of the body at the time force is employed in their impulsion onward, even while in a state of motion; and why the coffin does not suffer as well as the navicular, cannot satisfactorily be accounted for;

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it is in fact a part rarely diseased.

Zanesville, O. T. WEBB, V. S.

For the Ohio Cultivator.

Diseases of the Horses' Foot.

Little complaint is made of disease of the feet in other animals, but we are continually advised of horses being lame in their feet. How are we to account for this?

First, we must consider the habits or usages of the domesticated animals, and consider that a vital orgasm (as vascular as the brain) similar to a machine of human invention, wears out and becomes liable to disorder, according to the use made of it.

The horse is an animal of action and of speed, and lies down less than any other animal that puts his feet to continual trial. His trot is hard, gallops hard, his leaps are high and precipitous, straining every nerve and sinew when racing. Adding to these, he is frequently called upon to perform these feats on a hard and rough road, unyielding to a degree, causing concussion and battering of the hoofs, the hoofs being found insufficient protection against such roads.

Art has introduced the employment of horse shoes, causing a prolific source of lameness in horses.

There need not be any surprise felt, when we consider the intricate mechanism of the interior part of the foot; the functions of its several parts are liable to be interfered with and obstructed; the tissues are frequently mechanically injured by the force of action on hard roads. The foot is obnoxious to disease, owing to being seated in tissues differing from any other part of the body; the laminæ of the foot are of texture and function unlike other parts; the coronet also has its peculiarities, also the sensitive sole, and frog, and even the coffin-bone itself.

The disease I am about to treat of is, Acute Laminitis, (commonly called Founder.) Were I asked, from what disease the horse experiences the most suffering, I should answer, Laminitis or inflammation of the Laminæ of the feet. Still, there are other conditions wherein the animal suffers most acutely, for a time, but there is no one where the pain is so great or apt to be so protacted as the disease of so called founder. We need not be surprised at this, when we consider that the diseased parts are peculiar and sensitive in their nature, placed under peculiar conditions and situated between two unyielding bodies, the hoof without and the coffin-bone within, so that when the inflammation takes place, the opposition of these unyielding bodies, and consequent pressure of nerves highly sensitive as they now are, produces pain in the extreme, and this extreme pain, together with the situation in which it is felt, gives rise to symptoms distressing and singularly characteristic.

The approach of the disease is not sudden; a horse after a hard drive, or trying feat, will stand in the stable sometime before founder is discovered, and we account for it in this wise—exercise augments the circulation of the blood through the feet, whilst rest proves unfavourable to it; so that after great exertion over hard roads, the planter vessels become over-charged to such a degree, that the veins are incapable when at rest, of relieving the extreme radicals of the arteries and veins, hence congestion followed by inflammations,

The symptoms of the disease are such as cannot be mistaken. The horse presents himself in great misery, panting and breathing hard from the pain he is enduring. The aspect and position is striking, the hind feet advanced under the body (that is supposing the disease to be in the fore feet alone) that he may relieve the painful fore feet from the superincumbent weight; if forced to move forward he will shuffle his hind feet further underneath him, and step very lightly upon his heels, or else make a sort of leap forward. One would think that lying down would afford relief to the poor sufferer, but I have known horses in the greatest state of suffering, stand pawing and scraping day and night. The inflammation is so intense, that the heat can be felt through the hoofs; the vessels which supply the inflamed part with blood, are under inflammatory action, in a state of fullness, and pulsate violently under the pressure of the fingers. The pain altogether, is of the most distressing character,

disordering the system so much that symptomatic fever is the inevitable consequence, causing the animal to become alarmingly sick, much excited, anxious look, hot all over, and frequently sweating through the agony he is in. The mouth is parched, breath hot, respiration short, hurried and painful; pulse 70 or 80; parts of the body in a state of tremor; his countenance imploringly asking for relief.

Drinking cold water while heated, over loading or gorging the stomach, will also produce inflammation of the feet; for such is the sympathy between the stomach, intestines, and the cutaneous surface, that if we acknowledge the hoofs as being a continuation of the common skin, this is not to be wondered at. In studying the course and termination of this disease, we are satisfied that all the soft tissues of the foot are effected more or less, also the coffin-bone which is perforated in every part for the passage of blood vessels, likewise partake of the inflammatory action.

In this disease it is of the utmost consequence that our treatment should be prompt and energetic to check or subdue it at once; in doing this, a great deal depends on the condition we find the horse in, in general. The first thing necessary to be done is to remove the shoes, to relieve the feet from all constraint; Should the shoes be heavy, replace with light shoes, tacking them on with four nails without clinching. This releases the foot from compression.

Pare the cleft of the frog and introduce frog setons, bleed copiously from the jugular veins, envelope the feet in large warm bran poultices, carefully clothe him, give a large dose of physic, feed on bran mashes. Give chilled water, and in forty-eight hours the physic will be working, the setons discharging, and the horse on the road to recovery.

Much may be said for and against this mode of treatment, but I am bound by my own practice to declare myself in favour of it; it has in the worst of cases worked wonders, and therefore I have every reason to be pleased with it. But should the disease continue to advance and the pain continue very great, immerse the feet in hot water, and persist in the application of poultices or any other means to encourage the discharge of the setons; and give a couple of drachms of solid opium, once or twice in the course of twenty-four hours, as the case may require; do not fear the amount, for you know not what enormous doses a horse can take, while suffering from inflammation of the feet.

T. Webb, V. S.

Zanesville, Oct. 1861.

For the Ohio Cultivator.

Cattle Disease in Hamilton Co.

In this part of Hamilton Co. we have a disease at the present time prevailing considerably amongst cattle, and which is here called black tongue; they are taken—cows and cattle—with a stiffness in the legs, an apparent extreme tenderness or soreness of the feet; so that upon stepping they act as though they were moving amongst hot embers; their mouths become very sore, tongue stiff so that they do not use it to lick; tongue and teeth black; tears run out at the corners of the eyes, they lay round apart from the other cattle and eat little or nothing; and I have been told this disease has proved fatal in several cases at no very great distance from where I write.

These are the symptoms as described by neighbors who have witnessed it: in my own experience an ox was taken about 3 weeks ago with the lameness and extreme tenderness of foot, the shedding of tears and laying round; we bled him in the neck, swabbed his mouth with fish brine; his tongue was not black but dark colored; the teeth were not black; this ox's tongue did not get stiff but he used it freely to lick all the time; he has got well; his mate is now laboring under the same symptoms, tongue however is a good healthy color and he freely uses it; I went out this morning to swab his mouth, but from the appearance of his mouth and tongue contented myself with washing his feet with fish brine.

An intelligent German tells me they have the disease in Germany that they use the fish brine to wash both feet and mouth two or three times a day.

My ox that was first taken I pronounced to be foundered and upon referring to "Youatt on Cattle" I could neither find Founder or Black tongue. H. B.

Preston, Sept. 14, 1861.

Entomology.

The Army Worm.

BY J. KIRKPATRICK, CLEVELAND, O.

[We have been looking for the learned Bugologists to give the world a compact little essay upon the Army Worm, which has been so destructive in many parts of this country the past season. Several persons have essayed to treat upon the subject, chief of whom are Mr. Thomas of Ill., Kirkpatrick of Cleveland, and Dr. Fitch of N. Y. The two first named gentlemen have had field experience with their subject, while the last has seen it from afar. Mr. Kirkpatrick has furnished a paper on this subject for the forthcoming Ohio Ag. Report, which, though not written with the method and perspicuity most desirable in a scientific paper, contains the most available matter for our present purpose. Without following the exact arrangement of the author, we propose to dish up the essay in two chapters: first, of the history and description of the worm, and second, of remedies proposed, Secretary Klippart having kindly placed the advance sheets at our disposal.—Ed. *Field Notes.*

Although the army worm has been long known to southern and western farmers, from the injury committed by it on various field crops—grains and grasses—yet, from some cause, it has not received that attention from scientific men which the importance and amount of its ravages demanded. All that was known of it was, that an insect of that name suddenly appeared in some locality not previously visited by it, or at least for many years, and laid waste the meadows or fields of grain around. In numbers it equaled the dreaded locusts of the east, and its serried battalions, advancing in regular ranks, swept bare the fields, leaving nothing but desolation where but a day before there were smiling harvests. In Kentucky and the more southern States its appearance was more regular than farther north, and its ravages were more dreaded, and it seldom appeared in great numbers in the great wheat regions. In the eastern States, as well as in the northwest and Canada, it was unknown. But in nearly all the regions mentioned, this insect has, in all probability, occurred regularly, and may now be found, not in the immense numbers in which they attract attention, but as isolated individuals. The present season seems to be peculiarly favorable to their increase, for they have appeared in all, or nearly all, the western, and also in some of the eastern and middle States, in such numbers as to attract the attention of the public, from their destruction of meadow grass, wheat, oats, corn, &c. It would be much within the mark to say, that the loss to the country for the present year, from this cause, amounts to many hundred thousand dollars, and consequently it is of great importance to examine into their history and the conditions under which they usually appear, so that means may be taken to put a stop to their ravages, if possible.

In 1855, I first had an opportunity to examine the army worm, having discovered it on the Cuyahoga flats near Cleveland, in June of that year. At that time I did not know the caterpillars observed bore that name, nothing being on record of its appearance in the northern part of our State, and the parent moth had never been identified, no one knowing, at least among the writers, anything about it. To be sure, Say, in his letters to C. W. Capers, had described the moth of the cotton army worm under the name of *Noctua Xylina*, and Harris, in his "Insects Injurious to Vegetation," has added to our knowledge of that insect the color of the caterpillars: but this differs materially from that of our army worm, and can, by no means, apply to it, although there is less difference in the colors of the parent moths. Both insects belong, however, to the same family. The moths have considerable resemblance, and the caterpillars have the same number of legs, though differing in color, the cotton army worm being the handsomest, as it is of a bright green, with black stripes and spots: in destructive ability they are about equal. On page 246 of the Ohio Agricultural Report for 1855, I described the army worm and its transformation, as far as then known to me.

The present season has proved very favorable for making a close examination of the habits of the army worm, owing to its appearance under nearly uniform conditions in so many different parts of the country. In the region lying south of 40 deg. north latitude, these caterpillars were observed two to four weeks earlier than in the lands lying north of that line. This was, of course, modified considerably by local circumstances; but they had come and gone in the

counties bordering on the Ohio river nearly four weeks prior to their being observed on the southern shore of Lake Erie. This may be partly explained by the earlier seasons of the southern counties, but not entirely, for in those counties the worm appeared soon enough to destroy part of the wheat crop, while in the north it did not appear until after that crop was entirely secured. So far north as Sidney, Shelby county, the caterpillars entered the ground, and changed to a pupa on the 16th of June. On the 7th of July the moth appeared. In Cuyahoga county the worms were not observed until about the first of August, and now (the 6th) they are undergoing their pupa transformation, and, as it will take not less than fourteen days to change to the perfect moth, there will be a difference of at least six weeks in the time of the departure as well as appearance of this insect in two counties, the centres of which are but 125 miles apart, and one less than 80 miles south of the other. In the northern, or lake counties, army worms were usually first observed in oat fields, and, as far as I had an opportunity to observe, in such as had a rather moist soil. In no case did they appear on dry upland, unless there was a moist spot somewhere in or near the field, and from this spot they seem to have traveled in all directions where food was attainable, unless hindered by some deep ditch, clear water, or a well-traveled road, and even in this latter case thousands would endeavor to cross, many succeeding.

Of the early history of the caterpillar we know little, for it seems never to have been observed until it had attained considerable size, and the individuals had spread over the field, making their ravages apparent. The smallest seen by me were about three-quarters of an inch in length. The parent moth deposits her eggs—and she has several hundreds of them—among fresh herbage of a kind suitable to the wants of her offspring. The young succulent leaves of the oats proved just such as were wanted, and to such her instinct led her; their natural habitat is probably the wild grasses of our swamps, but this cultivated herbage is much better and far more abundant. These eggs are probably placed on the underside of the leaves, and in clusters, where they remain until hatched. In such a position the young obtain abundance of food, and are protected from the hot sun by the cool green leaves. While small they can eat but little, and consequently the damage done is not apparent. In a short time, however, they become large and their voracity increases; the herbage among which they were bred is all devoured, and hunger drives them forth in search of new pastures. Spreading in every direction they eat as they go; in front there are waving fields of green, behind a tract of desert as clean swept as if burnt, unless weeds had previously usurped the place of the crop, and these are usually left standing memorials of poor farming.

The army worm is an epicure, and therefore unlike the grasshopper and locust. When in moderate numbers they are more choice in the selection of their food than they can be where the fields are overrun by their hordes; then they select the tenderest blade of some favorite grass or grain, leaving the midrib of the leaf untouched, but when, in the "struggle for life," each has to do the best it can for subsistence, nearly all grasses or grains come alike welcome, and all but the hard stems are devoured. In the oat field all the blades are eaten and the caterpillar ascends the stalk to the very top, and finishes by biting off nearly all the grains and letting them fall to the ground. As they do not eat the grain, this may be looked upon as wanton destruction. We learn that in the wheat and other grain fields, they often cut off the ears and let them fall to the ground. The only cause for this seems to be that they eat a portion of the finer parts of the peduncle or stalk. If the grain is cut previous to the worm leaving the field, and left out to dry, the insects will still continue feeding on the cut grain, and thousands may be found during the heat of the day, sheltered beneath the swath or bundles, so that it becomes necessary to remove the grain as soon as possible after cutting.

The resting time of the army worm is during mid-day. Their feeding time, morning, evening and night, and at these times they also travel. When resting they are usually coiled up in circle or snake fashion. When traveling they move at a moderate pace, avoiding all steep places if possible, and prefering level land. They can climb well enough if the ground is firm or covered with herbage, but if loose and friable they loose their footing, and fall back while endeavoring to climb any steep ridge. When arrived at their full growth they enter the ground to the depth of an inch or more, or burrow beneath some fence rail, old log, or loose turf, and there form an oval cell by rolling their bodies around several times, the sides of the cell being probably slightly

consolidated by some secretion of the caterpillar, but the walls are always friable and easily broken. In a day or two they cast their skins and become a light brown pupa that becomes darker in a few days, and is finally of a deep mahogany brown color, and in this condition is quite inert, unless handled, when they will jerk about violently. In this state they do no harm, as they cannot eat. While in the caterpillar state the army worm casts its skin often, and slightly changes its color, being nearly black when young, and much lighter when full grown. In from 14 to 20 days (14 with me), the pupa bursts its bonds and comes forth a light brownish moth, a decided night-flier. The males seek their mates, and after copulation the females select a spot for the deposition of their eggs.

It is not positively known how many broods of army worms there are in a year, but there is no doubt that there is at least two, for the moths hatched in midsummer deposit their eggs immediately after, and the last brood must remain either in the caterpillar or pupa state throughout the winter. It is somewhat remarkable that with the exception of a single specimen, all the moths hatched by me or received by others in different parts of the State, have been males. May not this suggest to the mind of the scientific reader a possibility of the undue increase of this species, as well as many others of the Noctuidæ, being the result, in some way, of parthenogenesis. Such sudden increase of insect life has never been satisfactorily explained, and it is doubtful if this would do it, but it would explain the disproportion of the sexes in the summer broods, if the unfecundated eggs of the female moth, like those of the queen bee, would produce males only. I throw this out merely as a suggestion.

The family of moths—*Noctuidæ* — to which the army worm belongs, contains a great number of injurious insects, in fact all are vegetable feeders; but a portion content themselves with weeds and the leaves of trees and shrubs, many of them being of no economical value. Among those that are remarkable for their injurious habits are the spindle worms of the corns—*Gortyna zeæ*, which is also so hurtful to dahlias, burrowing in their stems in the same manner as with corn. The cut-worms of the corn, cabbage, etc. —*Agrotis* ——; of these there are many species, the transformations of which have never been described.

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PAGINATION I

counties bordering on the Ohio river nearly four weeks prior to their being observed on the southern shore of Lake Erie. This may be partly explained by the earlier seasons of the southern counties, but not entirely, for in those counties the worm appeared soon enough to destroy part of the wheat crop, while in the north it did not appear until after that crop was entirely secured. So far north as Sidney, Shelby county, the caterpillars entered the ground, and changed to a pupa on the 16th of June. On the 7th of July the moth appeared. In Cuyahoga county the worms were not observed until about the first of August, and now (the 6th) they are undergoing their pupa transformation, and, as it will take not less than fourteen days to change to the perfect moth, there will be a difference of at least six weeks in the time of the departure as well as appearance of this insect in two counties, the centres of which are but 125 miles apart, and one less than 80 miles south of the other. In the northern, or lake counties, army worms were usually first observed in oat fields, and, as far as I had an opportunity to observe, in such as had a rather moist soil. In no case did they appear on dry upland, unless there was a moist spot somewhere in or near the field, and from this spot they seem to have traveled in all directions where food was attainable, unless hindered by some deep ditch, clear water, or a well-traveled road, and even in this latter case thousands would endeavor to cross, many succeeding.

Of the early history of the caterpillar we know little, for it seems never to have been observed until it had attained considerable size, and the individuals had spread over the field, making their ravages apparent. The smallest seen by me were about three-quarters of an inch in length. The parent moth deposits her eggs—and she has several hundreds of them—among fresh herbage of a kind suitable to the wants of her offspring. The young succulent leaves of the oats proved just such as were wanted, and to such her instinct led her; their natural habitat is probably the wild grasses of our swamps, but this cultivated herbage is much better and far more abundant. These eggs are probably placed on the underside of the leaves, and in clusters, where they remain until hatched. In such a position the young obtain abundance of food, and are protected from the hot sun by the cool green leaves. While small they can eat but little, and consequently the damage done is not apparent. In a short time, however, they become large and their voracity increases; the herbage among which they were bred is all devoured, and hunger drives them forth in search of new pastures. Spreading in every direction they eat as they go; in front there are waving fields of green, behind a tract of desert as clean swept as if burnt, unless weeds had previously usurped the place of the crop, and these are usually left standing memorials of poor farming.

The army worm is an epicure, and therefore unlike the grasshopper and locust. When in moderate numbers they are more choice in the selection of their food than they can be where the fields are overrun by their hordes; then they select the tenderest blade of some favorite grass or grain, leaving the midrib of the leaf untouched, but when, in the "struggle for life," each has to do the best it can for subsistence, nearly all grasses or grains come alike welcome, and all but the hard stems are devoured. In the oat field all the blades are eaten and the caterpillar ascends the stalk to the very top, and finishes by biting off nearly all the grains and letting them fall to the ground. As they do not eat the grain, this may be looked upon as wanton destruction. We learn that in the wheat and other grain fields, they often cut off the ears and let them fall to the ground. The only cause for this seems to be that they eat a portion of the finer parts of the peduncle or stalk. If the grain is cut previous to the worm leaving the field, and left out to dry, the insects will still continue feeding on the cut grain, and thousands may be found during the heat of the day, sheltered beneath the swath or bundles, so that it becomes necessary to remove the grain as soon as possible after cutting.

The resting time of the army worm is during mid-day. Their feeding time, morning, evening and night, and at these times they also travel. When resting they are usually coiled up in circle or snake fashion. When traveling they move at a moderate pace, avoiding all steep places if possible, and prefering level land. They can climb well enough if the ground is firm or covered with herbage, but if loose and friable they loose their footing, and fall back while endeavoring to climb any steep ridge. When arrived at their full growth they enter the ground to the depth of an inch or more, or burrow beneath some fence rail, old log, or loose turf, and there form an oval cell by rolling their bodies around several times, the sides of the cell being probably slightly

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consolidated by some secretion of the caterpillar, but the walls are always friable and easily broken. In a day or two they cast their skins and become a light brown pupa that becomes darker in a few days, and is finally of a deep mahogany brown color, and in this condition is quite inert, unless handled, when they will jerk about violently. In this state they do no harm, as they cannot eat. While in the caterpillar state the army worm casts its skin often, and slightly changes its color, being nearly black when young, and much lighter when full grown. In from 14 to 20 days (14 with me), the pupa bursts its bonds and comes forth a light brownish moth, a decided night-flier. The males seek their mates, and after copulation the females select a spot for the deposition of their eggs.

It is not positively known how many broods of army worms there are in a year, but there is no doubt that there is at least two, for the moths hatched in midsummer deposit their eggs immediately after, and the last brood must remain either in the caterpillar or pupa state throughout the winter. It is somewhat remarkable that with the exception of a single specimen, all the moths hatched by me or received by others in different parts of the State, have been males. May not this suggest to the mind of the scientific reader a possibility of the undue increase of this species, as well as many others of the Noctuidæ, being the result, in some way, of parthenogenesis. Such sudden increase of insect life has never been satisfactorily explained, and it is doubtful if this would do it, but it would explain the disproportion of the sexes in the summer broods, if the unfecundated eggs of the female moth, like those of the queen bee, would produce males only. I throw this out merely as a suggestion.

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ish—extent of the wings one inch and nine-twelfths.

The perfect insect is a night flier, and will sometimes enter houses if a lamp is burning, but I suspect that it is the males only that do so, the other sex is not so apt to burn their wings in this manner. They probably feed on the honey of flowers, although the great object with them is the continuance of their species. After this is effected the parents soon die. No moth ever saw her children.

REMEDIES PROPOSED.

In the government of nature, the undue increase of any individual species of organized being is prevented by a series of counter-checks. Letting alone the exhaustion of the proper food of the species, all have enemies that prey upon them. The plant eating insects are kept in check by other insects, birds, reptiles, and other animals. Many species of birds derive their whole nourishment from insects alone; others a large proportion, mingled with the seeds and fruits of plants; and many of these, although looked upon with aversion by the farmer as great thieves, are yet of incalculable benefit in ridding the fields and orchards of injurious insects. None of these birds are viewed with more dislike than the various species of black-bird—*Agelaius phœniceus, Molothrus pecoris, Scolecophagus, ferrugineus,* and *Qinscalus versicolor*—yet all are insect feeders, and the great flocks of the red-winged blackbird now visiting the fields denuded by the army worm, are doing good service in reducing the numbers of that destroyer.

But among all the living beings that prey on injurious insects, none are so efficient as the parastic ichneumons and flies. I have discovered two species that make the army worms their prey, but have not as yet had an opportunity to examine the perfect insect of either. One, however, probably belongs to the genus *Microgaster.* The female deposits one or more eggs—sometimes seven or eight—in or on the thoracic segments of the caterpillar, and the young larvae, when hatched, burrow within the body of the insect, devouring the fatty matter surrounding the vital parts. After being fully grown they issue from the skin, and spin minute cocoons on the back of the worm and attached to it. These cocoons are of a yellowish white color, and measure but one-third of an inch in length, and about half that in diameter. A caterpillar, on which there are seven or eight of these tiny foes, seldom arrives at its full growth, but shrivels up and dies, and those having a less number die when about to change to pupæ. In one field examined, four-fifths of the caterpillars were oviposited upon by this ichneumon, and consequently all such would die without propagating their species. Among a lot of army worms from Avon, Lorain County, kept in a breeding cage, I discovered that many died soon, and on examination these proved to be destroyed by the maggot of a winged fly, probably a *Tachina.* These larves were about five lines in length, blunt behind, and tapering anteriorly; the mouth armed with a pair of strong curved jaws. The color was a uniform yellowish white; the jaws black. In the most of the caterpillars there was but a single maggot, but in few there were two or three. Where there was one only, the caterpillars were not entirely disemboweled, but where there were more, nothing was left but the empty skin. All the viscerœ had entirely disappeared, even to the interior of the head and eyes, as well as all the fatty matters. When the maggot has arrived at its full growth, it usually leaves the body of its victim, burrowing beneath some light earth, grass or leaves, and then changes into a coarctate pupa of a smooth, egg-like form, about a quarter of an inch in length; at first this pupa is soft and light colored, but finally hardens and becomes of a deep brown. An hour suffices for undergoing the change from a living rapacious maggot to a perfectly motionless pupa; the remains of the mouth still remain attached after the change, and may be seen at the now blunt anterior end. In a few cases the maggot did not leave the skin of the caterpillar, but changed within it. This change takes place at the same time the unhurt caterpillars undergo their pupa change, and has yet to be discovered if both insects assume the perfect state at the same time, although this is more than probable. With these two parasites, and the destruction by birds and other animals, we need not fear any great increase of the army worms, for the check thus supplied by a kind Providence is all-sufficient. They will appear occasionally in great numbers, but this undue increase but combines the assaults of their foes, thus bringing them within bounds again.*

* Since writing the above, I have observed that in a lot of about twenty caterpillars, three only have been able to change to pupæ. All those infested with *Microgasters* have died. Among these I also discovered several coarctate pupæ like those of the *Tachina,* but larger, and probably belonging to another species of that genus.

When the army worms are numerous, it is desirable to arrest their ravages; the most common, and probably the easiest method of doing this is that commonly practiced—ploughing a double furrow around the field, or across any part of a field that they are marching toward. It is necessary to have the steep side of the furrow next the unharmed crop, so that when the worm attempts to climb over, it may fall back into the furrow. Running the plough once in the furrow is not sufficient; twice, and even three times is better, and it requires to be renewed if washed down by rains. If the soil is stiff or stony the worms will climb over the steepest ridge—it is on light, friable soil only that the ridge will suffice to protect the field; the foothold of the worm must give way, thus rolling it back into the furrow. And even under the best conditions of soil it is best to have two furrows, one about the width of a row of corn from the other. The The worms thus trapped should be destroyed either by fire or hogs; laying dry straw in the furrows, and then setting fire to it is a good way, for by this means the soil is made more friable, and of course efficient. Where, however, there is dry grass or grain near by, this is a dangerous method, as the fire may extend to the field, and do more harm than the army worm could if let alone.

Thousands of army worms may be easily destroyed in a meadow, by running a heavy iron roller over it. A very small pressure is sufficient to burst their skins, and the slightest injury of this kind will kill them. If the meadow or field is level, few worms will escape the roller, and thus a stop will be put to them at once. Of course this cannot succeed as well where the ground is rough and uneven, for the worms always take shelter in the hollows. The best time to roll is while the worms are feeding, and up among the leaves, for then they are sure to be crushed; at other times they are sheltered and a great number will escape.

Anything applied to a field for the purpose of making the foliage distasteful or poisonous to the caterpillars, would ruin the crop, and involve great danger both to man and stock; better far to burn the crop at once. As soon as the crop is removed from an infested field, turn in all the hogs you can, and also chickens and turkeys; ducks will do a great deal of good, by searching for and eating the caterpillars. All these animals will eat the fallen grain, and thus save it in making flesh and fowl.

Sheep turned into the field will kill many of the worms by tramping upon them, especially will this be the case if the flock is large. If crows and black-birds are visiting the fields, do not let them be disturbed, there never was a crow or black-bird that would not prefer a fat caterpillar to a grain of corn, oats or wheat. They will, however, as every one knows, eat all of these at times. Where there are no insects drive them away.

It does not appear that anything can be applied to the soil so as to repel or prevent the appearance of the army worm, unless it be salt; this applied in considerable quantity would prove injurious to the caterpillars, and might kill them when about to undergo their change to pupæ, but I have not tried it, and know of no one who has. Unfortunately, however, the parasitic larves that destroy the army worms, would suffer in an equal, if not increased degree, as the decaying bodies of their victims would absorb the salt and make their destruction sure, and poultry and birds of nearly all kinds would also suffer. Army worms cannot appear for a series of years on the same ground for the reasons above given. Their enemies increase more rapidly than ever they do, and but few comparatively ever arrive at the perfect state and are capable of reproducing their kinds, and even then, night hawks and whip-poor-wills, with many other birds that hunt in the early morning and evening, destroy multitudes. And it must always be remembered that where there is much food, there will soon be many feeders.

Bees Demoralized.—The bees carried over to the Barbadoes and the Western Isles, ceased to lay up honey after the first year. They found the weather so fine, and materials for honey so plentiful, that they quitted their grave, prudent and mercantile character, became exceedingly profligate and debauched, eat up their capital, resolved to work no more, and amused themselves by flying about the sugar-houses and stinging the blacks. The fact is, that by putting animals in different situations, you may change, and even reverse, any of their original propensities.

Practice flows from principle; for as a man thinks, so he will act.

And also a single pupa of a large ichneumon, the cocoon of which measures half an inch in length. So there are at least three known parasitic insects that feed on the army worms, and if the coarctate pupa should prove specifically distinct from the other *Tachina*, four species, and it is highly probable that further investigation will show that there are several others.—K.

The Horseman.

Balance in Horseback Riding.

BY VERE D. HUNT.

The Centre of Gravity Displaced.—Disorganization the Consequence.

Although the principle arrrived at by this train of reasoning are illustrated and realised in the figure and action of the wild horse of the Pampas or of the Desert, as we observe him pictured and described in works of travellers; and although in the figure and action of other quadrupeds which have not been subjected to draught or burthen, such as the deer, the hare, the greyhound, we observe they all use the fore legs for the purposes of support only, and all in bringing up their propellers overtake and support the centre of gravity, attaining so to that beautiful balance of the figure which gives such an air of grace and ease to their movements: yet we rarely, if ever, find the domesticated horse exhibiting a single one of those characteristics of action which such a distribution of his powers ought to produce. On the contrary, we find him in almost every case thrown more or less on his fore legs, not only for support, but for means of progression, to make up for the deficient exercise of his true propellers; and as the application of any instrument in the economy of nature to purposes for which nature has not designed it is necessarily attended with disease, we rarely, if ever, find him free from blemish; while in a majority of cases effects amounting almost to unsoundness are repulsively visible, crippling his movements, shortening the period of his usefulness, and detracting from the pleasure and advantage of his owner.

It may at first sight appear strange, that these imperfections in carriage, with their attendant train of malformations and blemishes, should exist in the young animal as he is usually put into the hands of the trainer; but nothing is more certain than that peculiarities of gait and carriage are transmitted from one generation to another.

The observant inquirer will be at no loss to account for the original introduction of those peculiarities, they being all owing to the mistaken mannner in which the animal in his natural state has been subjected to the artificial duties of draught and burthen. The wild horse, unaccustomed to either, moves in perfect balance, because at each stride he brings up his propellers to the point directly beneath his centre of gravity; but the moment he receives a rider or other burthen, that centre is shifted forward; for, the seat which convenience resorts to for the saddle or back-band, just behind the withers, and on which we impose all the burthens we lay upon the animal, is so situated, that a heavy body placed there does not press over the point where the weight of the *unencumbered* animal is concentrated, but several inches in advance of it. The new centre of gravity of the whole mass is thus shifted forward to an intermediate point, more or less in advance of that to which the animal in his wild state had been accustomed, and beyond which nature has not taught him to bring up his propellers. The consequence is, that his hind legs now act at a disadvantage, and the animal, to make up for their diminished deficiency, has recourse to his fore legs as instruments not only of support but of progression.

This is the first fatal step; it leads directly to all the evils that usually beset this noble creature. The fore legs having now assumed the office of propellers, must, as we have already seen, come to the ground in a state of contraction, and as their structure precludes contraction at any joint except that of the knee, they now come to the ground with a bend at that joint, and are thus at once converted from the straight and firm supporters, which they were before the change of the centre of gravity, into a pair of bent and tottering props, ready at the least trip or interruption to collapse beneath their burthen. Thus, the direct and immediate consequence of the first false step is, that the horse becomes a stumbler, and is continually subject to the danger of breaking his knees.

But further, the bending of the knee, however slight, shortens more or less the height of the support afforded to the fore quarter by the leg; and it is a well-known fact, that if a weight be carried between two points, one of which is lower than the other, as if a hand-barrow be borne between a long and short man, the burthen falls more heavily on the latter. But without that bending of the knee the animal is unable to compensate for the loss of power which he now experiences in his true propellers; the next step towards destruction which he therefore takes, is to make up for this loss of height in his anterior supporters, made necessary by that compensation for the loss of power in his hind legs to which I have just adverted, by straightening out his pasterns, and standing

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as it were on his toes. This restores the level, and relieves the fore legs from that increa-ed burthen to which the bending of the knee had subjected them; but it doubles the risk of stumbling, and brings on directly every one of that multiplicity of diseases to which the forefoot and leg are so notoriously subject.

For the pastern now, instead of acting as an oblique spring interposed between the hoof and the rest of the limb for the prevention of excessive concussion, becomes a direct and rigid prolongation of the shank, and so communicates to the whole limb, and to that delicate plate of muscles which forms its only attachment to the rest of the frame, the shock of every stroke of the hoof against the ground. If we begin at the hoof, and trace the direct consequences upwards, we shall find first that the hoof, no longer resting flat on the ground, but bearing chiefly on the toe, becomes liable to contraction, both directly from the resistance of the iron shoe, and indirectly (which is the most frequent symptom) from internal inflammation resulting from the same cause; that the small bones of the foot, *squeezed* together by the weight resting directly on the extremity of the coffin bone, are all in their turn liable to inflammation at their points of juncture, the navicular bone especially, which is so often the seat of the worst cases of lameness, that the deposit of bone stimulated by the pressure and concussion to which all the parts are thus exposed, the joints become liable to callosities and bony enlargements, which too frequently involve the whole foot in some of the worst species of unsoundness, in shape of ossified cartilages and ring-bone.

Following the mischief up the leg, we next find the back sinew, which nature only designed for the purpose of lifting the foot and contracting the pastern, deprived of all opportunity of exercising its proper functions, and so exposed to these enlargements consequent on that state of relaxation, so often mistaken for sprain in the back sinew. Ascending higher, we find increased tendency to bony deposits, consequent on accumulated concussion of the parts promoting the formation of enlarged splents, which, though callous in themselves, almost invariably produce lameness when they exceed very limited dimensions, by pressing against and irritating the sensitive sheaths of the tendons which play over and beside them; and finally carrying our investigation to the upper extremity of the limb (with the cursory remark that this tendency to increased bony deposits, caused by accumulated concussion consequent on the straightening out of the pastern joint, will affect the bones of the arm and shoulder as well as those of the foot and shank), we find the plate of muscles forming the attachment by which the blade-bone is fixed to the trunk suffering as well as the rest of the limb from the same evils; the shock of every stroke of the hoof against the ground, no longer broken by the elastic play of the pastern joint, being communicated directly to these fibres, which, not being designed by nature for resisting such concussions, are often affected by inflammation and even rupture, producing the most serious cases of shoulder lameness.

But the evil does not rest here; this bending of the knee and straightening of the pasterns necessarily throws the fore feet backward; these now standing in the way of the hind feet, the latter also fall back from their proper position, thus aggravating the evil already existing by throwing a still further burthen upon the fore feet, which, again yielding to the increased bending of the knees and greater erectness of the pasterns, called for by the increasing necessity for finding some progressive power independent of the true propellers, creep back a little farther, and push the hind feet more and more from their natural position, till the latter, no longer resting flat on the ground under an oblique pastern, but propped on the toes with the pastern extending similarly to the fore feet, become liable to similar evils, only that those bony deposits which are the invariable accompaniments of concusson, taking the form of splents on the shank of the fore leg, assume the more formidable character of spavin in the joint of the hock.

Such are the pains by which nature admonishes us of the abuse of any of her provisions; and as her arrangements have been systematically disregarded, time out of mind, by the manner in which we task our beasts of burthen, it is not surprising that, with the addition of other similar abuses conjointly, they should be productive of evil consequences to the horse generally, and that he should come into the world with an inclination to a faulty carriage, and predisposed to disease.

NOTE.—Here is a most invaluable chapter to horsemen, explaining how our saddle horses are so universally knocked up by unskilled riders. The War Department should have it printed in red letter and made the catechism of every mounted officer and dragoon in the service.—ED. *Field Notes.*

The Farm.

For the Ohio Cultivator.

Mole Drainage in Madison Co.

Wishing to induce all mankind, if possible, to speedily adopt the Mole Plow to underdrain their soils, I beg to offer the experiments of some of our most intelligent, reliable farmers, to the consideration of your numerous readers.

W. Withrow, Esq., near this place, has now in successful operation, cut during the past three years, some 5,000 rods—or say 16 miles, of mole drainage, made with the Roland and Forbes plow, which has guage to regulate, and show to operator the depth at which it is running, and also a capstan hoister to raise out of ground by lever, making work of pulling out and moving forward, much easier than to raise by team. Mr. W. has one single cut extending about 125 rods. Drains average near 33 inches below the surface, and were made at a cost of not to exceed *five cents per rod.* Mr. W. makes about 100 rods per day, on average. Has constructed drains at *all* seasons of year, and finds all working equally well.

Mr. Robert Armstrong has made by far the largest amount of the mole drains, and was perhaps the *first* in the county to purchase a machine. He obtained the Marquis and Emerson (Ill.) Plow, the mole of which is large and some six inches in width on bottom. In some three and a half years Mr. Armstrong has constructed nearly 9,000 rods, or perhaps full 30 miles, 2,000 rods of which has been cut the past spring. His farm is black loam, almost level. Average cut per day, about 100 rods—has made 160 rods in a day this year. Cuts all about three and a half feet, at a cost of perhaps not to exceed 5 cents per rod. Has one drain—first cut—three-fourths of a mile in length, winding through the lowest part of a prairie, and passing over rise, discharging freely at *both ends.*

After cutting one long drain, Mr. A. concluded to change direction, and cut at right angles, draining *directly across first cut,* all at same depth, some eight or ten drains. He considered the first drain worthless, but some time after, it began to discharge and has increased in volume, until it is now nearly, if not quite, as good as any other. This proves conclusively, that mole drains are not easily closed up.

Mr. A. advises me that he shall continue cutting, yearly, until his whole farm of some 1,250 acres is thoroughly underdrained. He is fully convinced that they will last as well as any other, and are just as effectual in carrying off surplus water, as tile, stone, or any other material.

Now we of Madison have demonstrated that in *all* soils of a compact subsoil, the Mole Plow will answer the purpose desired. That it is more economic, easier and quicker made than *any other*, none can doubt. On the mooted point of durability, none need hesitate to adopt this system, as our experience, running back nearly four years, proves that each year the mole drain becomes better and better, discharging more freely now than when first constructed, and in Illinois, I am advised by good men, that drains have now been in operation 10 to 12 years, and are as good as at first.

Feeling a deep interest in our farm husbandry, and being well convinced that no other one thing is so much needed as thorough underdrainage, to insure large and certain returns for labor, I beg you to assist in promulgating the glad tidings that the Mole Plow is just the thing wanted by all—fine spun theories, with a bad precedent of discord on the Continent, notwithstanding. *Practice* is often opposed to *theory*, and this mole drainage is one of the exceptions in favor of the latter.

But to avoid prolixity, I close, with advice to our Ohio farmers to speedily commence the mole drainage, feeling convinced that it will prove the desideratum with all lands possessing a compact subsoil. I will be pleased to communicate with any *Field Notes* readers or others, who may desire information respecting machines, cost, etc.

Truly, I. F. Willis.

London, O., Sept., 1861.

Harvesting Potatoes.

The idea has generally prevailed that potatoes, especially those grown in low and moist lands, are essentially benefitted by exposure to the sun and air before removing them to the bins. This, however, experience has long since demonstrated to be a fallacy. The sooner potatoes are in the cellar, protected from the sun's rays, after they are removed from the hills, the better, the operation of the solar rays having a powerful tendency not only to deteriorate greatly their eating qualities, but also to render them far less likely to keep well through the subsequent spring.

Another very popular error, and one no less productive of bad consequences, is the supposition that the tubers should be scrupulously and thoroughly cleansed from dirt, the presence of which, in ever so small a quantity, is considered by many to be the radical cause of their becoming watery and unfit for food. Any one, however, who will take the trouble of experimenting, may easily satisfy himself that this is not the case; and that potatoes that have been thoroughly cleansed by washing or drying, or indeed, process which effectually rids them of soil, by any will exhibit symptoms of decay, and be come unfit for culinary purposes, much sooner than those which have not.

In many sections it is a common practice with farmers to select a portion of their best almost perfectly matured and developed tubers and pack them carefully and compactly in barrels, filling the space between the roots with soil, cool and moist. The barrels thus filled are placed in some dark corner of the cellar, where they remain undisturbed till the contents are demanded for the market, late in the season, or for domestic use.

Secured in this manner, and deposited beyond the reach of light or heat, or where they will be as little exposed as possible to these powerful agents, potatoes will keep perfectly sound and retain their eating properties unimpaired until late the following year.

Every observing farmer must have noticed that the potatoes that are "crowded out" from the sides of hills, or which are found so near the surface as to be frequently exposed to heavy rains washing away the soil, always turn *green*, and, when cooking, have a sweet coppery taste, which is extremely nauseating and unpleasant. This is always a result of exposure to solar action; it concentrates a principle which the potato contains in conjunction with many others of a nutritious nature, into an active poison, and hastens greatly the decay and decomposition of the roots. As soon as they are taken from the soil, they should be placed in the bins.—*Republican Journal.*

Aftermath or Rowen Hay.

What should be done with the grass which grows on land from which a crop of hay has been taken the same season? is a question which every farmer must decide according to his own special circumstances or wants. Yet an attempt has been made to lay down a peremptory rule, that the second growth should neither be fed off or mowed. The reason assigned for this position is, that by taking off the second growth, the subsequent crops are lessened. But the real point to be considered is—In what way can the grass be used to most advantage? Is it worth more to be left on the land, than to be cut and made into hay or to be fed off? Admitting it to be of value as left untouched, the farmer must consider whether that value is greater than that of the milk or flesh it might make, either green or dry.

We were lately walking over a handsome meadow on which was a good second growth of grass, and inquired of the owner what he intended to do with it. He replied that he was going to feed it off, although he was aware, he said, that in so doing he should run counter to the "preaching" of some agricultural writers. He said he had good reason to believe that the benefit of "old fog" had been greatly exaggerated, and related the following circumstance in support of this belief:—One of his neighbors was so strenuously opposed to feeding off the second crop, that he would not allow a hoof to enter his mowing fields except to bring off the hay. In the course of events our informant came into possession of the land at a time when on some portion of it, there was a good second crop of grass. He resolved to try one lot in such a way that he could compare the effect of leaving the grass on the ground with the effect of feeding it off. The lot was therefore fairly divided, one part fed by cows through early autumn, and the other kept to receive all the benefits of grass. The next season both were mowed at the same time, and the crop of the portion which had been fed was the heaviest and of the best quality. The grass which had come up through the "old fog," our friend said was taller, but thinner at bottom and less in weight than that where the cows had run, besides being depreciated

PAGINATION I

in quality by the dry stuff that was mixed with it.

Care was taken in this case—and should be taken in all cases—not to feed the ground too closely. There may be too much grass or too little for the success of the crop of the following year. If there is too much it smothers the life out of the grass roots, more or less, gives space for wild plants to grow, and forms a bed for the short-tailed field mouse to winter in, where he revels on the tender blades which were put forth last, cutting them clear to the "crown," and doing great damage. If too little grass is left on the ground, the exposure to the direct action of the frost and to changes in the weather through the winter, especially if there is no snow, is too great.

The latter result is often referred to by persons who are opposed to feeding or cutting the after-growth of meadows; yet with singular inconsistency, they sometimes confine their stock to pastures till by the pressure of hunger they gnaw the grass to the very roots, which of course essentially lessens the growth of the following year.—Would it not have been better to have relieved the pastures by feeding the mowing-grounds to some extent, and thus have left in both cases the proper amount of grass, as nearly as practicable, for the requisite winter protection?—*Boston Cultivator.*

Handling Steers for Oxen.

Several years ago, while visiting in Medina Co., we were treated to a sight of ox-breaking which it is pleasant to remember. A gentleman in Litchfield had four Devon steers in training; with a long whip stock and short lash, he paraded without yokes, by ones, by twos, by fours, changing front and any way he choose; and all without noise or confusion, but by simple kindness and perseverance. We notice an item in this line from the Tribune report of the N. Y. State Fair this year, which, with the general subject, we commend to all the boys and men who have cattle breaking to do.—[Ed. *Field Notes.*

I have seen one thing to-day which I wish every farmer, and every man who ever drives oxen, or handles cattle in any way, could see as I have seen. It would teach him the great benefits of the law of kindness. Here is a boy perhaps 10 years old, training and handling six steers, not yet two years old, with all the ease that an experienced Yankee ox-driver handles a single pair while in the yoke; and he has no yoke, no rope, nor does he speak a word scarcely above a loud whisper, and only occasionally strikes a blow that would raise a blister upon the skin of a child. All his actions are based upon the laws of kindness, with a firm determination that all his orders must be obeyed.

Now he brings up a single pair as though yoked together; then two yoke, then three; then he mismatches all of them as though he were about to yoke the off ox on the near side. Then he changes places, and puts odd ones together; then he unyokes, if I may use the term when he does not use a yoke, all of them, and brings them up in a line like a platoon of soldiers, and with greater precision than any "awkward squad." Then he trains them round by two and three, or drops out a single one and orders him to a new place by a motion of his small whip or, as it seemed to me, often by a mere effort of his will that he desired a change of position.

For an hour that I stood watching, there was another pair of older steers standing just outside of the circle of his operations, patiently waiting their turn, until some one asked: "Can you handle eight as well as six?" "I could" he modestly replied, "if my whip was a little longer. I can't reach the outside one, when in line with this short whip, but I will try." And so he did; and notwithstanding the short whip, all were managed with the utmost ease, and all who saw taught a lesson which none seemed to tire of learning. I hope they will profit by it. Will those who read also profit so far as to pursue the same course in training all domestic animals. Teach your boys too, to yoke up the young steers, to use them kindly, with patient perseverance, to make them as bidable as this boy has these now on exhibition, and then they will make good, and valuable oxen.

Fast Growing Pork.—The *New England Farmer* says: We do not *work our hogs*, either in harness or in the manure heaps. When they have taken their meals and what exercise they please, they retire to a dry, roomy bed, lie down and grow, and make a business of it. An Irishman can overhaul the manure heap much cheaper than the hogs can. We slaughtered swine last fall, made from pigs that weighed less than 36 pounds each eleven months before, and the hogs weighed, when handsomely dressed, from 450 to 475 pounds each!

Thought is the wind, knowledge the sail, and mankind the vessel.

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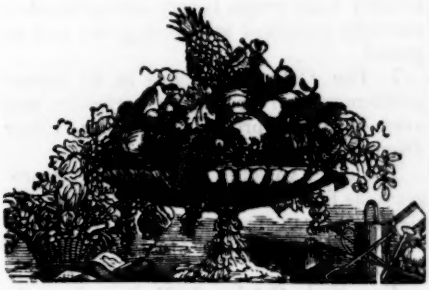

The Garden.

For the Ohio Cultivator.

The Flower Garden.

Bulbous Roots.—Many persons who are great admirers of the most gorgeous flowers of spring, are not aware that to secure the finest blooms of bulbous plants, the roots must be planted out in the fall. During October and November, is the right time for planting; the earlier date for larger Japan Lilies and Hyacinths.

Prepare the ground well by deep digging and thorough pulverizing. A rich old garden mold, somewhat sandy, is the best soil for bulbs. Set the roots four inches below the surface, and heap up the earth two inches above the roots, to protect from frost during the winter. Set the roots from six to eight inches apart.

The common white lily has a scaleform root, which may be divided, and each scale will produce two new roots or bulbs. One white lily root, taken from the ground in August, and the large outside scales or layers taken off carefully one by one, and deposited on a shelf in a moderately warm and damp room or cellar, will produce two bulbs to every layer, by October; these carefully set in light soil, and not too deeply covered at first, will grow, and thus these magnificent flowers become plentiful in our gardens, with no expense beyond a little labor and care.

Peonies.—These splendid bloomers used to be held so sacred, that one might almost as well have asked her neighbor for a set of her silver spoons, as a *root* from her great overgrown Peony bed. But Peonies may be produced almost *ad infinitum* by dividing roots. We know many a country cluster of the old-fashioned crimson peony that, if carefully separated, would put twenty gardens into a blush, by next June; while being left as they are—the roots crowding each other, and twisting and snarling into tangles, by and by they will cease to bloom and die out entirely. Divide among your neighbors, and your own plants will be greatly benefitted through your generosity. Don't set your roots in the shade, but choose the sunniest spot you can find, and let the March sunbeams come a-courting without even the bare limbs of a locust overhead to interfere with the amour, and there will be love blushes in May on the top of every stem.

F. D. G.

Fall Management of Grape Vines.

The month of November, after the leaves have fallen off, is the best time to prune vines. There is no difference of opinion at all on this point with *experienced* grape growers, and it must be done in the fall to succeed well in grape culture.

The principle should be fully understood, the fruit of next year is to grow from canes of *this season's growth.* Not one person in four who has grape vines on his premises seems to understand this important fact. They have read about it in the agricultural papers, but they paid little attention to it, and seldom or never acted upon it in pruning their vines.

Select the best canes of this year for the next fruiting season, and cut out all the old wood, provided you have new wood enough that grows out near the base of the vine. If the new wood consists of *laterals,* (that is, the side canes or shoots of old wood,) you should simply leave enough of these laterals to bear a fair crop next year, and cut back all the rest to *one eye.* The true system is to cut back every other shoot, so that the new wood of *next* year may be produced from the eyes left upon the canes thus cut back. This is the *renewal* system, which is practiced as well upon the side spurs and canes as on those that grow from the base of the vine.

It matters not how you train your vines, whether to trellises, stakes or otherwise, this renewal system must be adopted in pruning, because no cane, shoot or spur *ever bears fruit but one season.*

The month of November is also the time to gather cuttings to set in the following spring. Let them be of well matured wood of this year's growth (but older wood will grow,) and cut them from twelve to eighteen inches long, with from two to four eyes, according to the length of the joints; and if you have but a few, they may be kept safely in the cellar, packed in a box in layers with sand or garden mold spread among them compactly, so as to exclude air. The sand or the mold should contain just enough moisture to prevent the cuttings from drying. Sand is recommended by horticulturists, but I find that the soil of my garden does just as well as sand; and I simply lay my cuttings upon the surface of the soil in layers, and cover them with earth (having too many to put into my cellar,) and they are preserved in excellent condition.

[*Genesee Farmer.* T. B. MINER.

Notes on Native Grapes.

Another grape season has nearly passed with us, and it has been sufficiently favorable to enable us to profit by our observation on the result:

1. The *Delaware*, we think, has well sustained itself as the *first* in rank for delicious flavor for the table, and also for wine, in so far as a limited experience can determine. It also seems to be both hardy and productive. As the vines increase in age and strength the bunches enlarge, until some weigh nearly a pound. The bunches are usually very weighty for the size. It ripens nearly two weeks before the Isabella. The first day they were on sale in Broadway, the price was 75 cents per pound; next day and since, 50 cents per pound.

2. The *Diana* ranks next, according to our taste and judgment.

3. The *Concord* has certainly gained in favor this year, being sweeter than heretofore, although by no means equal to the above.

4. The *Hartford Prolific* has also improved in reputation, and its very *early* ripening and hardiness north will make a few vines desirable, although it lacks high flavor, and drops from the bunches in ripening.

5. The *Isabella* has gained in flavor in city yards and when grown in sheltered situations in New Jersey, but it has lost flavor when grown in vineyards north of us, on account of its acidity.

6. The *Anna* has proved fine when well ripened, and next to that the *Rebecca*, another white grape, is very agreeable when carefully protected and well grown and ripened.

7. The *Catawba* remains in its former position, seldom ripening in perfection, and even then we prefer the earlier, richer *Diana*.

The other varieties have not made progress, as far as I am aware, and with the above we can patiently afford to wait.—"Haste makes waste" too often in new fruits. R. G. P.

New York, October, 1861.

We commend these conclusions of our valued friend Pardee to the consideration of our readers. They are the result of careful and extended observation. We seldom have occasion to differ with our friend in judgment. If we changed the order of this list of grapes, it would be to transpose the Diana and Concord. With us the Diana has not ripened till two weeks after the Concord on the same trellis, and in quantity is fifty per cent. less. It is a grape of a higher character than the Concord, but its productiveness and late maturity would place it No. 3, and the Concord should take its place.—EDS.

[*New York Observer.*

Bulbs for Fall Planting,

Old Dr. Kennicott blossoms out in the Prairie Farmer concerning hardy bulbs:

The Crocus.—This is our earliest vernal flower, of the cheap class. There are numerous varieties of different colors, and a lengthened floral season. The "Cloth of gold,' or *C. Suisiana*, was in full bloom at the Grove, on the 2d day of March last, and other sorts came in, all through that month and April. Indeed, I have known them bloom here, on the south side of a snow bank. The bulbs are cheap, seldom selling higher than $2 per 100.

The *Siberian squill, Persian Iris, Snow Drop*, etc., are early, hardy and desirable. The first, a most lovely blue, and the second, with singularly marked colors, and a delightful concealed fragrance that "scents the garden round." Unfortunately, these bulbs do not increase rapidly, and the price is rather high.

The *Narcissus* is a large family, of showy, and many of them exceeding fragrant flowers. The prevailing colors, yellow and white. Their season, from April to June. The old Daffodil, Jonquil, etc., belong to this family, as well as the grandly trussed and scented Polythus Narcissus.

Hyacinths.—These are the most fashionable of our hardy bulbs, and well deserve a high rank, on account of their exquisite fragrance, vivid colors and heavy pyramids of elegant wax-like florets. The best hyacinths are rather expensive; but good bulbs are often sold at from $1 to $2 per dozen.

The Tulip.—Of all "Florists Flowers," this was at one time, king. Incredible sums were given for single bulb, and a choice collection was considered about equal, in value, to a gallery of the master-pieces of art. The Tulip is certainly a splendid plant, and a bed of a thousand or two of them is the most gorgeous floral show imaginable, when at their best; and the most brilliantly colored sorts—those making the most show—are usually the easiest to raise, and the cheapest in price, while varieties answering to all the requirements of the tulip fancier are often less taking in masses, though found singularly beautiful on closer inspection.

Some tulips — like the Van Tholls — bloom in April, and a few double sorts extend into June, but "May is the month of tulips," as June is that of roses. The cheap, showy sorts breed rapidly, and rarely die out, even though little cared for.—The best ones are more delicate and less prolific, and should be cared for accordingly.

Choice beds had better be re-set every two years, perhaps, but ordinary sorts may stand three seasons or more, where the soil is suitable, or until the plants get too much crowded. A double tulip is, as a rule, less valuable than a single one, though many persons admire them.

Crown Imperials.—These are hardy bulbs, with very glossy foliage, showy flowers, and an imposing habit of growth, but the odor of the entire plant is any thing rather than agreeable. A good, early spring plant for clumps, at a little distance to the leeward. You must not keep the bulbs long out of the ground, or they will perish.

The *Calchicum.* These are curious plants, blooming in September and October, showing no sign of foliage with the flowers —the rich broad leaves and seed vessels appearing early in spring. But I am writing too much for once.

October is the best month to plant all these bulbs, (except, perhaps, the last named, which may be set in July or August) though earlier will do, and any time before the ground freezes may do. Soil should be dry, deep and fertile; better dig 18 inches than less, and better good virgin soil than coarse manure. Fine compost, or old cow manure is more admissible, well worked under. Plant bulbs from 2½ to 5 inches deep, according to size, and if the ground be dry and light, press down firmly, after finishing your bed, and see well to surface drainage. Cover all, at the approach of winter, with coarse manure or leaves, straw, etc., and *remove it* again, the moment the plants pierce the soil, in early spring.

Grafting the Grape.

In the month of April I grafted twenty-four Delaware scions into roots of the common wild Fox grape of Nebraska. I used pieces of roots about eight inches long, and the scion with two buds only. These I set in the ground close up to the top bud on the scion, and packed the dirt down closely about them. Of these 21 have made a growth of over two feet. I used no wax, clay or tieing, leaving the junction entirely open to the contact of the earth.

The same day, I gave twelve Dianas the same stocks and treatment—while but seven grew out of the dozen. Twelve Rebecca's treated precisely the same way and growing in same ground, are all alive and growing finely.

The next day I grafted four dozen:—twelve Concord, twelve Delaware, twelve Diana and twelve Anna on roots of the Clinton Grape. But four are growing of the Concord; nine of the Delaware; two of Diana; and four of Anna.

Waiting until the buds of the wild Fox were fairly started, I grafted four dozen: twelve Louisa; twelve Herbamont; twelve Hartford Prolific and twelve Union Village, and every graft is alive and making wood rapidly. These had the same treatment as the first and all the rest; the only difference being in time of grafting. I am satisfied that the Fox will make a very good stock for the native varieties, but the blue frost grape is much better, and throws up a larger growth of wood. I have but a half dozen, on this stock and they are now six feet high. Another season they will fibre freely.

The past spring I set out in rows in open ground two thousand cuttings of the Catawba, Clinton and Isabella. Nine-tenths of the whole lot are now growing. Set out two hundred Concord, two hundred Diana and fifty Canadian Chief, not one half of these are growing. The Clinton grows more speedily than any of the others.

[*Nebraska Far.* R. O Thompson.

The Orchard.

Low Branching Fruit Trees.

BY WILLIAM BACON, RICHMOND, MASS.

In years gone by, as the remaining trees in old orchards show, there was an almost univeral practice of throwing the tree-tops high into the air; first, by allowing the trunks to arise some six or seven feet before they throw out branches; and second, by pruning the branches near the trunk, leaving merely a tuft of limbs at the extremities of these naked arms. These outside tree-heads, formed on branches that had the appearance of *artificial* trees thrown out from the trunk, of course receded further from the main body of the tree each year.

The disadvantages of this way of growing trees are, their greater liability to be shaken and broken by high winds; the longer the lever, the greater the power in raising heavy bodies; the further the heavy tree-top is removed from the earth, the more power the winds will exert to overturn a tree. Then the branches are more liable to be broken by the weight of the top being far removed from the trunk, or, if not directly broken, they are severely twisted, and thus made unhealthy, which, in due time, insures their decay.

The fruit on such trees is much more liable to be prematurely blown off by high winds; they are gathered with much more difficulty when mature. If the tree is shaken, as is still the custom with many, it is sadly bruised by the fall from these high tree-tops; and if picked off, the danger to life and limb in the operation is increased in a greater ratio than the increasing distance from the ground.

But there is yet another objection to this method of tree-forming, fully equal to, if not greater than, all others. Sap is the life of the tree, and the excess of sap goes to perfect the fruit. The longer the trunk and branches of the tree, the more of this must go to support the wood; the more the small branches are thrown into tufts at the extremities of large limbs, the fewer will be the leaves to elaborate sap for the nourishment of the tree, and perfection of the fruit; consequently, a feeble tree and small and inferior fruit will, in the end, be the result of the miserable system.

By the above noted system of tree-growing, they are more exposed to the ravages of insects. The more bare wood, and greater exposure of it to atmospheric changes, the feebler the tree, and more subject to attacks, not only of the hosts of animal depredators that feed most greedily upon such trees; lichens gather on them more readily, and feed on their very vitals. Any one must know that these evils cannot be so readily contended with on a high, ill-shapen tree as when near the surface; so that, besides the increased amount of danger from the evils alluded to, the difficulty of obviating them is so much increased that, in a sort of indolent discouragement, they are neglected, and old, moss-covered, worm-webbed, insect-bored trees in a few years take the place of what may now be a young, thrifty and promising orchard.

When Nature raises trees, she does it on her own economical plan—one best calculated to give health and long life to her subject. In the forest we see trees shoot up their tall, mast-like trunks with a few branches at their extremities. Such trees are protected by surrounding trees while the forest remains; but remove the burden of timber, and how the remaining trees are rocked and shaken by the wind! How often their beautiful heads are decapitated by the raging storm! Who ever saw such trees on the border of a wood lot, or standing in isolated positions about fields? Such trees, if on the border of woodlands, throw out branches near the ground, to shield the body of the tree from storms and sunbeams. And the specimen of unrivalled symmetry in the field—how low its branches, and how beautifully it throws its long arms abroad! Yet these arms are not the naked ones that invite disease, but all along their length they throw out little branches, from each of which a clump of leaves appear to aid in furnishing the tree with healthy life-blood. If these branches become too numerous, or if the weaker interfere with the stronger, nature prunes and casts off what is superfluous.

But to our fruit trees. The best specimen of an apple tree we ever saw, made its head so near the ground that a person can without difficulty step into the lower branches, and these branches spread so low that the fruit can be gathered without difficulty by a person standing on the ground. They are long branches, and the top of a tree forms a symmetrical hemisphere. Neither the axe nor the saw has been accessory to forming that tree-head. The hand and the pruning-knife directed the first starting of these branches, and here they stopped, un-

less two combatant branches so interfered with each other's rights that one of them must be removed. This tree-top is so dense and so wide, that the hot midsummer sun cannot send his fiery rays to scorch the unprotected part of the tree. They fall upon its leafy head, and the warm atmosphere is diffused along the trunk and among the branches. No insects have ever disturbed the tree, unless it were some straggling worm that so far forgot the rules of propriety and honor as to commence its web among its branches. And, what is far better, it has never failed of a crop since it commenced bearing.

Low trees come into leaf, flower, etc., earlier than tall ones. A Pear tree seven feet high had branches within a foot of the surface of the ground. The lowest branches were in full leaf before the buds on the top of the tree had developed the color of the leaf. And a plum tree, with branches near the ground, gave blossoms on the lower branches from a week to ten days earlier than they appeared in the upper part of the tree. Let the difference continue in the same ratio through the season, and many of our fruits would be raised in much higher perfection than they now are.

We have no doubt but many of our old orchards have been injured more by injudicious over-pruning than in any other way. Tree-pruning was almost a mania. It must be done every spring. The lower limb must be taken off, and that branch pruned as far out as the operator dared to venture, and could reach with the destructive axe. Such a system of tree-torturing and tree-mutilating could not be otherwise than destructive.

[Here are important truths, forcibly put. There is one point that we should have made stronger, and that is, that low-branched trees come into bearing at an earlier age than others. We think there can be no doubt at all about this; it ought, therefore, in connection with other manifest advantages, to determine our treatment of fruit trees. We commend Mr. Bacon's remarks to serious consideration.—Ed. [*Hort.*

Keeping Grapes.—We are in the habit of keeping grapes for common use during the winter, in the following manner: Take clean cheese boxes, pick off the bunches of grapes carefully, and pack them in dry grape leaves. Keep the boxes in a dry, cool place, being careful to not let them freeze. We generally have grapes till May.

Joseph Cope.

The Farm.

Road Making.

Park Carriage Roads and Wagon Roads.

Road-making is a scientific pursuit, and to follow it successfully it requires a thorough knowledge of its principles. Dr. Lardner says, "I do not know that I could suggest any one problem to be proposed to an engineer which would require a greater exertion of scientific skill and practical knowledge, than laying out a road;" and we doubt if he could have found a man in this country who would not feel grossly insulted if he were told the plain truth, that he is ignorant of the first principles. There is money enough squandered every year in building ornamental roads in an improper manner, that, if judiciously expended, would add materially to the embellishment of a place, instead of being worse than buried a couple of feet below the surface.

The limit of permanence and durablity ought to be a study with those who construct road, instead of adopting the expensive fallacy, that of one foot of broken stone is good, two or three are necessarily better.

The chief characteristic of a good road, aside from beauty of location and alignment are smoothness, hardness, and permanence, and the most desirable of all is to get these with the most economy of means; the true way to do which is to adopt at once those principles which long years of scientific investigation and experiments have proved to be good.

The true location of an ornamental road would be in graceful flowing lines, the grade of which should be distributed uniformly throughout its length. Its position should be such that no more surface water than falls on it should flow over it; it must not be the channel towards which, and through which the surface water of adjoining and higher land will flow. One of the most important considerations, after a well-studied location, is thorough drainage wherever it is required. The earth bed should be dry and firm, and prepared in the same degree of convexity that is intended for the finished surface. The depth of the excavation for the road metal need not exceed six inches as an average; it will, however, in adjusting the grades, be more in some places and less in others; but the whole thickness of road metal, including the binding, need not under any circumstances be over six inches.

There are two well-known methods of constructing broken-stone roads, those of Telford and McAdam; the former having rough pavement of stones well wedged or chinked down so that they can not move, and covered with a layer of broken stone, 2½ inches cube, and finished with a blending material of good, clean gravel 1½ inches in depth, The McAdam plan is to have all the stone broken to 2½ inches cube, put on in three layers, each of which is to be worked in by use, and finally becoming consolidated into a firm, compact, impenetrable body, without the aid of any other material.

Of late years a third plan of making broken-stone roads has been introduced by Mr. Bayldon an English engineer of high repute. It embraces portions of the Telford and McAdam plan, with some admirable improvements. It consists of putting on the broken stone, 2½ inches cube, in a single body, rolling it thoroughly; then 1½ inches of blending material, either gravel, ashes, fine chippings of tough stone, scoria, or furnace cinders, and thus opening at once to the traveling public a finished road, instead of compelling them to consolidate a mass of broken stone, as in the McAdam plan.

The Telford and Bayldon systems are the only two that should be used for metaling an ornamental road, the McAdam system being objectionable from the length of time required to compact the mass, and from the fine dust ground from the stone to aid in the process of consolidation.

We have stated that six inches of broken stone are sufficient for an ornamental roads; but if the Telford plan is used it may have to be a little thicker; not necessarily so, but for more convenience in laying it. In a road of this thickness, the only trouble will be with the frost; if the ground be well drained, and the road well rolled when the frost comes out, no harm will be done. On public highways sustaining a continuous stream of trade and travel, four and six-horse loaded teams, and rapidly driven post coaches, the average thickness of the Telford road was 11 inches.—Mr. McAdam considers 10 inches sufficient to carry the heaviest traffic, while on the Leeds and Wakefield Turnpike, in England, in 1841, which was constructed on the Bayldon system, the entire thickness was 7 inches, and in 1857 was in full use and good repair, although worn down to an average depth of 3¼ inches, in some places being only 1 to 1½ inches thick.

For an ornamental road, or, in fact, for any other, we give our preference to the Bayldon system. We believe, all things considered, that it is the cheapest and most durable road; that the expense of breaking up the stone is less than the extra hauling and labor of laying the Telford pavement; and that it presents the simplest form of construction, so plain that any one from working drawings and specifications could make a road.

Now this doctrine of using a thin layer of materials, properly and scientifically put together, and which has been thoroughly tested and established for from 30 to 50 years, is universally scouted among builders of ornamental roads, and we suppose for the reason that its human nature to deride or break down that which we can not understand, or which is at variance with preconceived notions.

We have within a week had occasion to examine ornamental roads, on which the labor of excavating from eighteen in. to two feet in depth, and the hauling alone of the materials to fill it up, have actually cost more money than an accomplished engineer would require to build a first-class road, one that will outlast two generations, and pay for itself twice over in the saving of repairs.

The prevalent manner of constructing broken stone ornamental roads is utterly devoid of any thing like skill or principle. A mass of stones of all sizes, from a foot to eighteen inches in depth, covered with about six inches of gravel, is the whole story; and on the principle that two wrongs make one right, the open stone work is to drain the gravel, and the gravel is to prevent the stones from rising to the surface. Such roads never become consolidated; the efforts of the larger stones to rise on top, keeps the road always open, and requires constant attention, while a properly constructed road grows better by use, and soon unites into a compact solid body, through which weeds can not grow, and which can be kept in a neat and polished order with the lightest care.

GEO. E. WOODWARD, C. E.
In Horticulturist.

Water Proof Cement. — The following cement has been used with great success in covering terraces, lining basins, soldering stones, and everywhere resisting the action of water. It is so hard that it scratches iron. It is formed of ninety-three parts of well burnt bricks and seven parts of lith-

arge, made plastic with linseed oil. The brick and litharge are pulverized; the latter must always be reduced to a very fine powder. They are mixed together, enough of linseed oil added. It is then applied in the manner of plaster, the body that is to be covered being always previously wet with a sponge. This precaution is indispensible, otherwise the oil would fritter through the body and prevent the mastic from acquiring hardness when covering a large surface it sometimes has in it, which must be filled up with a fresh quantity of cement. In three or four days it becomes hard and firm.

Lime-Wash for Shingles.

You ask of your readers information respecting lime-wash for shingles. I will give you my experience respecting it.—Twenty-eight years ago I built a porch on the main body of the house, running out west. Some twelve or fifteen years after, I saw the north roof covered with moss. I took a scaper and went out and scraped it off, and had to work carefully lest I should injure the shingles, they were so soft in consequence of their having been covered with the moss, which had grown there. I thought I should now have to shingle the roof again. I had about a bushel of slacked lime, and put it on the roof. My neighbors told me it would rend the shingles. Pretty soon a rain came and made it into a thick whitewash, running off the house, covering the windows below, so that it was difficult to see through them for some time.

About six or seven years since I saw moss gathering there again, and having more slacked lime I threw it on the roof. I looked up there to-day, and I thought if I had some more lime to put there before a good rain, my shingles might remain there some ten years more, while the south roof, which has had no lime put on it, had to be shingled, a part of it, some four or five years since.

If any one should notice, they might see, from the chimney down to the eaves of the roof, the shingles bright and fair, where the water, having struck the chimney laid in lime mortar, had washed them, and each side, where the water had passed down, the shingles covered with moss, and that, while wet, would naturally rot the shingles, and when it was dry, expose the house to fire, if a spark from the chimney were to lodge there on a rainy day.

I believe that lime is very good for wood exposed to the weather.—*Cor. Boston Cult.*

The Season and Crops.

October has held out rich and ripe to the end. Frosts have touched us lightly until on Monday morning of this week we had one which brought off the leaves in great profusion. There could not well have been a better month to finish up the late corn crops, which needed an extension of all the time they could have; and the crop will be a good one. Root crops have ripened finely and are of good quality, except that in some localities the potatoes are affected by the rot.

The fall feed is excellent and in fine order for winter pastures. In seasons like this, when the grasses get a check, or take a rest in early summer, as from a moderate drouth, and then make a good fall growth, they have a strong vitality to withstand the frosts of winter, and make the best of pasturage for winter. We have the most favorable reports of the quantity and condition of the growing wheat. With a strong root at this season, and the fields well surface-drained to prevent standing water, the wheat will go into winter quarters with every prospect of a favorable result.

The Farmer's Winter Work.

For the first time in the modern life of the west, there is every prospect that the farmers will have enough to do to keep them fully occupied in their work. The withdrawal of fifty thousand men from Ohio, nearly all from the laboring classes, and very many of them from the farm, will leave the winter's work to be carried through in very many cases, by the old men and the boys. Our rural population is by no means exhausted of stanch middle-aged men, but it would be impossible to withdraw a force of fifty thousand from the mass of laboring men of the State, without leaving a vacancy that will be felt.

The diversion of labor from its legitimate occupation, and the perversion of so much muscular force from production to consumption, or worse to extravagant waste, is one of the inseparable calamities of war. It remains for those who still stay by the homestead to mitigate this calamity as far as possible; and to this end, the home-guards — men, women and children — should put the premises in trim for winter, so as to enable them to see to affairs in the most advantageous and economical manner. The foddering, the fuel getting and the corn husking are three principal items in the season's labors. Add to these the marketing of produce and the careful oversight of all things which require the attention of the prudent husbandman and his women folks, will fill up the days and may-be part of the nights of the incoming winter.

Live Stock.

About Army Mules.

At Perryville, opposite Havre de Grace, 25 miles north-east from Baltimore, a great mule and wagon depot has been established. The American flag at that point waves in triumph over six thousand mules and three thousand wagons, with arrivals every day. A thick, heavy cloud of dust hovers over the region round about, and the air is resonant with multitudinous brays, intermingled with the hoarse cries of the mule-breaker.

THE MULE PENS.

Coming down from Port Deposit in a buggy, by the river road, in the outskirts of the city, we came upon a vast *corral* of U. S. wagons, inclosing a space of five or six acres. Inside the enclosure we noticed a perfect forest of long ears and a compact mass of black hides working and surging to and fro. There are quite a number of these pens near Perryville, each containing fifteen hundred or two thousand mules collected from all parts of the country, and stored in these pens to await the process of breaking.

BREAKING MULES.

Some distance from the pen we found the breaking ground, where about a hundred lusty darkies were engaged in the work of taking the mules through a rudimentary course of instruction preparatory to fitting them for duty in harness. The process of breaking is exciting and interesting, and not unattended with danger. The mule is driven into a "chute" just the width of his body, with strong wooden bars on each side, which prevent his kicking out laterally, and at the same time admit of his being handled through the cracks. A rope is then fastened to his jaw, and another tied as a girth around his belly; after which one is attached to his fore foot, and passed under the girth and out at the rear, in which condition he is turned out for the preliminary exercises, consisting of a series of frantic plunges, with some ludicrous ground and lofty tumbling, vicious attempts to bite, and strike with his fore feet. This exercise continues for a longer or shorter period of time, according to the intelligence and obstinacy of the subject. But your mule is not altogether such a fool as he looks, and after coming to grief a matter of a dozen times by means of the check rope, he wisely concludes that plunging and rearing is not remunerative, and lies still, either reflecting or groaning piteously. If unusually obstinate through the first course, he it trotted around the course at a double quick, and his hide copiously anointed with a stout cudgel.

After the first course, the mule then being supposed to have absorbed something of the rudiments of his education, is reconducted to the "chute," where he is invested with harness and again led forth, and another series of gymnastic exercises takes place.

After becoming somewhat accustomed to the harness, the mules are hitched up to the large wagons, and driven around the course. The operation of hitching up is a delicate one, requiring great care. The negro approaches cautionsly and gingerly, with his eye fixed on the mule's ears. A suspicious movement of the auricular appendages is seen, and the startled African springs backward quick as lightning, just in time to escape a flashing pair of heels. Again he approaches, and finally succeeds in hitching up. A brace of broken mules are usually put in the rear, with a team of wild ones in front.

Different phases of mule character are developed in the process of starting. Some plunge and rear all the time, others lie down and obstinately refuse to move; others kick out of the traces, face on the driver riding the saddle mule, rear up and viciously strike at him with their fore feet. Again one will remain properly quiet for a time, and then spring forward to the full length of his traces with such violence as to bring him to his knees. Nothing but the natural obstinacy of the mule prevents a general smash up. Fortunately, while one plunges forward, the other, through sheer perverseness, will pull back. Sometimes a forward mule will turn round in his traces, come to a dead halt, and stare at the driver in the most ludicrous and side-splitting manner.

SHOEING MULES.

A broad leather belt is passed around his belly, and the mule hoisted clear, when his feet are drawn back and fastened, when he helplessly submits to the operation of shoeing, entering sundry protests in the way of snorts and groans.

CURRYING.

This is an operation which hardly pays for the danger incurred. The mule is altogether too handy with his heels to render it a desirable employment. Sometimes a curry comb is fastened to an eight foot pole, when the groom stands out of range and rakes him down from 'long taw.'

WATERING THE MULES.

This is not the least interesting of the operations I witnessed at Perryville. The mules to the number of a thousand at a time, were driven down a small ravine in front of the hotel, spreading at its mouth to a width of about a hundred yards into the river. They rushed far out into the stream, so that the most of them were covered with the exception of their heads floundering and plunging, and lashing the water into foam, and all braying continually. They reminded me forcibly of a school of immense porpoises sporting in the water.

Negroes are exclusively employed in the breaking and training of mules at Perryville. I asked one of the men superintending the matter why this was so. "Well," said he, "a nigger is the next thing to a mule, anyhow. They understand each other better, and there is a natural affinity of character between them. The niggers like it, and I believe the mules like it too. At any rate, a nigger can break a mule twice as quick as a white man, and get more out of him after he is broken. We tried white men, but it would'nt do. The mules have no confidence in them."

They break about a hundred and twenty long ears a day at Perryville.—*Cor. Cincinnati Commercial.*

Horse Stables.

BY VERE D. HUNT, DUBLIN.

Upon what principle is it that dark stables are tolerated? Will it suffice for their total abolition to assure the public, that from them are derived the numerous cases of defective eyes and total blindness, so prominent a feature in the ills that horse-flesh is heir to, more particularly when acquainted with the fact, that in his natural state the occurrence of blindness is unknown in the animal, and that man has a stronger predisposition to it naturally.

There is a common error, that requires elucidation and correction, viz: the generally accepted idea, that a dark stable makes a horse rest better, and evidence more health and spirits at liberation from it, than when confined in one lighted. He comes out, no doubt, more warily, stares about more wildly, and gambols more freely after issuing from it, than from a well-lighted one. But be undeceived as to its being the effects of health. The sudden transition from darkness to light shocks and dims his power of vision, which causes a more gingerly and cautious step, erect ears, and timid bearing—(observe the ears of a blind horse, when treading his way unguided)—when the eyes accommodate themselves to the distressing light, distressing, because ignorantly excluded from his stable; the poor animal feels overjoyed at his release from the dispiriting influence of a dark prison house, and in the plenitude of his happiness, he "bucks" and jumps for joy, exhilarated by a sense of freedom and sudden restoration to those blessings, air and light, his heritage from his Creator.

How can we doubt the enervating effects of darkness upon animal life and spirits? The most hardened malefactors have been reduced to submission by it and solitude. Light is as essential to a healthy condition as is any other natural requirement, even food itself; and an animal can no more be healthful and comfortable without the one than the other. All the horse requires from man, to be vigorous and useful, is as near an approximation to his natural dictates as circumstances will allow; namely, light, air, food and exercise, with water more frequently than is customary. A short continuance in the latter system will convince the most skeptical of its importance, as generally a less quantity is so taken than when the animal is allowed to drink *ad libitum* twice a day.

Ventilation is imperative to the health and general soundness of animal nature. The air we inhale is a very different one from that which we expire: the former is atmospheric, and charged with life-sustaining qualities; the latter is constituted of deleterious gases, inimical to animal life. If not, therefore, carried away by proper ventilation, a combination of its poisonous qualities with the atmospheric air renders its inspiration a matter of certainty; and, as effect following upon cause, if the life-supporting qualities of that air be impregnated with death-dealing gases in insufficient quantities to suspend totally the functions of nature, we have, beyond the possibility of controversion, a proportionate deterioration of constitutional power.

The atmospheric air is a subtle compound fluid, consisting of two gases, viz: oxygen and nitrogen, the former being the ingredient to which it owes its vivifying qualities, the latter serving merely to dilute it, being in itself too powerful. The medium by which it exerts its agency are the lungs or lights—two bodies situated on either side of the chest, composed of a set of vessels for carrying the air into the infinite

small cells at their extremity; another set, termed veins, to carry the impure blood to the outside of these cells to be purified; and a third set, to carry the blood, when purified, to the heart, to be distributed by its powerful diffusive action throughout the body. The blood, in its course through the system, becomes impregnated with a peculiar matter, termed carbon, which is very obnoxious to the animal economy—so much so, that if the blood containing it were to pass through the vessels of the brain, immediate death would ensue; the blood loses in a degree its capacity for heat; it is therefore requisite to get rid of the poison and regain its lost caloric, which beautiful provision of nature is accomplished by the oxygen of the air attracting and uniting with the carbon of the blood, forming carbonic acid gas, a very deleterious poison. This operation being performed, and the air being of no further use, it is expelled from the lungs, changed very much in quality, being in the first place much hotter, and also having lost a portion of its salubrious property or oxygen, in room of which is taken up a portion of poison, or carbonic acid gas; this addition and subtraction of principles occurs from six to eight times per minute. Now when we consider there are other poisons pervading the stable, also enervating and injurious to animal sustenance, consisting of sulphureted hydrogen, etc., and fœtid ammonical exhalations from the fæces and urine, what must be the evident consequences? That were it not for the timely, though accidental interference, of the groom in opening the door of the stable in the morning, it is within the limits of possibility that the truly miserable quadruped would shortly be suffocated, seeing that a tenth part per cent. of carbonic acid in the atmosphere would ensure it.

The question may occur to the reader not well informed on the subject before us: Why does not this poison collect in the atmosphere out of doors, seeing that at all times there is plentiful sources of it in the respiration of animals, combustion, fermentation, etc.? It would be so if the most minute dispensations were not attended to in that almighty whole, creation, under the never-sleeping eye of a bountiful and vigilant Providence; and if by one of these beautiful arrangements,—the attributes of the mighty Governor of animate and inanimate nature,—the casuality had not been anticipated by the principle of vegetable existence; it being ordered that that enemy to live, carbonic acid gas, should be decomposed by them, retaining the carbonic, and setting the oxygen, the vivifying fluid of animate nature, free.

Here is an example to follow—a page from the workings of Nature! See how she provides against evil results, certain to ensue from existing causes, if not anticipated as we have seen! Let us, therefore, innovators though we be, adhere to the rule laid down to us, and not, by confining in a close house poisonous gases, defeat the beautiful arrangement of that Almighty whose every work is awe-inspiring, from excess of its merciful and wondrous complication.

The Pulse of the Horse.—During sleep is perhaps the most favorable time for counting the pulse and respiration of any horse in health: the average pulse is thirty-two; it rarely rises as high as thirty-six, or sinks below twenty-eight; it is set higher by veterinarians: but the foregoing is considered most correct. In ordinary breathing the respirations are six per minute; during sleep not more than four. This is very important to know, because disordered respirations form one very important part of veterinary surgery. In judging of that point, "wind," gallop a horse out of breath, agitate his respiration, and then let him rest in quiet, and his disturbed heaving at the flanks will speedily subside, if sound; if the horse's lungs are diseased the breathing will require several minutes for subsiding.

The First Cattle Show.—From the time that Elkanah Watson procured two merino sheep and introduced them into Berkshire county, now more than half a century ago, and subsequently was induced to notify an exhibition of them under the "Big Elm" on Pittsfield Common, cattle shows have been held. Mr Watson then reasoned from that trial and success, that if the show of two sheep excited so much interest and attention, then a larger show of different animals will excite more. Thus he reasoned, and reasoned logically too, as all subsequent experience and observation have abundantly demonstrated and confirmed. This show of the two merino sheep under the "Big Elm" in Pittsfield, Mr Watson claimed as the origin of cattle shows in America.—*Boston Cultivator.*

An Elk can run a mile and a half in two minutes; an antelope a mile in a minute; the wild mule of Tartary has a speed even greater than that.

Home Department.

MRS. FRANCES D. GAGE, EDITOR

For the Ohio Cultivator.

Idle Men and Over-Worked Women.

Out of our window, on the pave in front of our printing house block, I can count seventy-three full grown men. On the square on the other side nearly or quite as many more. Look which way I will, groups of men stand idling away time, smoking and chewing, to keep them content. This is not an uncommon occurence but an almost every-day affair. If you take a little journey, the crowds that stand upon the platforms at every depot, or loiter round the shops and hotels will astonish you. Men, idle men every where.

"Time is money" is a saying, so oft repeated that it is accepted as a truth. How much money are these men throwing away, how are they impoverishing themselves, and the country. Suppose the time of each of these worth one dollar per day, (and few will labor for less) what a sum lost to the great work-shop of life. Every five cents worth of tobacco or strong drink is also a dead loss. Bread consumed gives strength, but tobacco and whiskey, slowly and insidiously take it away, and undermine the health and constitution of the user.

A writer in last week's *Field Notes*, makes an estimate, that in the United States, one million two hundred and fifty thousand dollars are sunk daily, on these useless, worse than useless habits. Add to this the growing habit of idleness among men, or perhaps I should say, the want of regular employment, and is not the picture startling?

Who sustains all these loiterers? Who gets their meals? Who washes their shirts? Who mends, who works for them? I do not know a dozen in all that crowd, and yet I see among them three or four who have not earned a dollar for the last month. Each one has a wife and family at home. One of these wives goes out washing every day in the week, after getting *his* breakfast, milking the cow, measuring out and selling all she can spare of the milk to her neighbors, and fitting out two pretty children for school. He takes her hard-earned money, and keeps himself too near a mad-man or a fool all the week through, to be either a safe or comfortable companion. Another has a wife who sews or does whatever her hands find to do, to make the week's ends meet: and another—but why continue the picture? these things glare at us every where.

The washwoman's husband is a good mechanic and laborer and could earn in his ten hours, two dollars; she by her long day's work gets but fifty or seventy-five cents; and so with them all. Is it any wonder that women are despairing? and that when a contractor for army clothing opens his doors, and offers fifty cents a day, there is a rush of hundreds, asking to work ten hours, for half the poorest laborer's wages; and obliged to board themselves out of that, and often children also?

Is it any wonder they go away weeping, when they find they can have no place, no privilege in that crowded hall, amid its dust and noise, at the paltry price that would hardly keep a common gentleman in cigars and drinks?

Thousands of women, have given husbands over to the service of their country and are standing alone, buffetting with poverty, and are watching and waiting upon little children, who will many of them soon be fatherless; thousands of others, suddenly find themselves in poverty, that a year ago were in prosperous circumstances, and hands that could hardly arrange their own toilettes, are now hired to do the work of others; many others have dismissed the nurse girl and cook and are toiling in their own kitchens. This is turning more and more of

those who were servants and had their places a short time since, adrift in the world.

There are idle women, but fewer by far than in our country's prosperous days. There are those too, given over to frivolity and fashion, but the number is every day dwindling, and the tone of resolution and good sense one hears in all places, give hope and faith, that out of all this turmoil, and suffering, good may come, teaching us through the discipline of adversity, lessons of wisdom for the future, which alas! we all need.

Just here the six o'clock bell rang. I walked home, sat up till 10 P. M., working button holes in the linings of haversacks for our soldiers, went to bed, dreamed that the war with all its horrors had passed away,—that our beloved country was again prosperous and happy, our men industrious and temperate, and our women rejoicing in a broader and more earnest life of privilege and industrial employment; not a slave left upon our soil, and the whole world rejoicing in the glorious victory of free men, free labor, free speech and free thought, over tyrants and oppressors. F. D. G.

For the Ohio Cultivator.

My Rented Home.

BY MRS. F. D. GAGE.

My neat little home, tho' its only a rented one,
I try hard to love it as if 'twere my own;
And strive to be making my heart a contented one,
'Tis hard work sometimes, for the trouble I've known.

I plant and I sow, never saying its folly,
To seed on a soil that another may claim;
Such thoughts only bring us a sad melancholy;
Drop the seed, 'tis God's ground, and 'twill grow just the same.

It may blossom for me, it may bear fruit for others,
I shall have my reward in the deed,—time goes on.
If it flourish, who knows but good sisters and brothers,
Just renters like me, may be blessed when I'm gone?

The earth is not ours, selfish ones, for possessing:
We plant but for others to reap at the best,
And the more we can strew it with brightness and blessing,
The more I am thinking, ourselves will be blest.

Children always turn toward the light. O that grown-up people in this would become like little children.

The Housekeeper.

Household Economies.

Cabbage.—There is so little fruit this year in many localities, that anything which can supply its place in the way of vegetables is valuable. Cabbage, made into krout, is a very acceptable dish in the spring; a jar or two, in each family will do much in the way of variety—and especially where there are large gardens. Let the remembrance of the great army spread about over the country, stimulate every one that can, to put up one barrel or a dozen, for the use of the soldiers; we shall all be called upon for sympathies and charities, before spring. I visited Camp Chase the other day, and talked with many of the soldiers—"If we only had something like pickles or cabbage, something sour to eat with vinegar," they would say, and their very voices told how great was the demand *within*, for something of this kind. Save all the fruit possible, all the pickles, can all the tomatoes, that are ripe, and chop and pickle all the green ones. Don't stop to ask whether any body will buy, but resolve to give away if they will not, and you will save more lives to the country than the enemies will destroy.

Corned Beef.—It is almost time for corning beef for winter use.

Take one hundred pounds of such meat as we sing about in the old song:

"A streak of lean and a streak of fat,"

cut up nicely for the pot; lay it down in clean tubs or jars, and cover it with a brine made in this wise:

To four gallons of water, add four quarts of the best salt, one pint of molasses, or one pound of brown sugar; a half dozen red peppers; boil and skim well, set by to cool, adding when part cold, one ounce of salt petre; when fully cold, pour over the meat; this will cover one hundred pounds if well packed; put a round board cover over this and press it down under the brine with a big stone; let it stand about one week and then try it, and if you do not say—"thank you ma'm" for the recipe, I shall wonder.

I have used it twenty years and like it best of any.

Bed Bugs.—Girls, clean your bedsteads well this fall; fill the joints with hot sterine, and you will have far less trouble in the spring. F. D. G.

Pumpkin Cakes.—Cook a sweet or Yankee pumpkin, mash it up fine, but not stew it very dry, then stir in a sufficient quantity of corn meal to make it thick, add a little salt, set it off to cool. When cool enough make them out with your hands about a quarter of an inch thick, place them on a hot griddle and bake them fifteen or twenty minutes.

Butter them up and eat while hot,
And if they ain't good, then I've forgot;
As I've just eaten some for my dinner,
I call them good enough for any sinner.

A. R. C.

Patchwork Quilts—Some folks think that a penny saved is good as one earned; and I can truly say that I am one of that goodly number. Now one way to be economical and industrious is to piece up all the scraps of calico and muslin into patchwork quilts. There are some who even scorn the idea, and say they would rather do nothing than sew little bits of scraps together. La, yes! they like white counterpanes or curtain calico spreads enough better than patchwork quilts. Sure enough, some do and some don't; and I'm one among the latter sort. For my part I fancy such bed quilts, and I have no less than—than—well I won't tell how many for fear the boys will think that I am a candidate for matrimony. I have counted up the cost of such a quilt, and it all amounts to one dollar and seventy cents. If any of the girls will give their opinion on the subject they will much oblige AMANDA.

Mt. Gilead, Oct., 1861.

Gluten Paste.—Common animal glue is likely soon to be superseded by paste made of gluten. It looks like glue and is quite as strong. Gluten, which is to be had at all starch-manufactories, will dissolve in twice its weight of cold water, and may be used in a cold state. A pound of this vegetable glue will yield three pounds when dissolved. whereas a pound of animal glue does not yield more than two.

Preserving Butter.

It is often asserted that we cannot make an article of butter that will keep well through a whole summer here on the prairies. It is pleasant to prove the fallacy of such statements.

We can make a most excellent quality of butter here if we will try it intelligently. I have heard people complain that even late fall butter would not keep well until the ensuing spring. This need not be so. Last fall I put by a crock full for spring use, and it was sweet and fresh as need be when I commenced making in the spring. In May I put down a couple of crocks full of butter, trying the experiment of keeping them out of the cellar, and my success has been perfect.

The first crock that I packed, I made a small quantity of very strong brine and put in the crock, leaving salt in the bottom to the depth of less than half an inch. I then put in layer after layer of well packed butter; taking care to pack so closely that the brine would rise over the butter. When the crock was full, I sprinkled in a teacup full of salt, and covered it with a cloth, over which I laid an earthen dish to prevent any accident that might leave the butter exposed. This has stood in the pantry all through the melting days of summer, and is as fine and sweet now as could be desired.

The second crock I managed in this wise. I sprinkled the bottom over with dry salt. Then I put in a layer of butter, then a little more salt, then another layer of butter, and so on till the crock was packed. Then I covered and left it like the other in the pantry. This also kept perfectly.

To succeed in keeping butter from tainting, two things are of prime importance. First, the buttermilk must be all worked out. Secondly, it must be kept from the air. These two conditions observed, butter may be kept indefinitely. To preserve it over a year, after packing as I last described, lay over the layer of salt an inch in depth of pulverized charcoal, and it will keep for years. I think it greatly improves the quality of keeping, to salt and work out the milk and brine thoroughly, and just before packing to add a little fresh salt, working it in well. Butter will keep, but rancid buttermilk will not. H. M. T. C.

Dwight, Ill., Sept. 28, 1861.

Farm Work and House Work.

While it is true that the farmers are the most independent class of workers in the world, it is also true that they labor more hours and harder than most classes of men. They usually rise before the sun has struck a light, and work until "evening lets her curtain down, and pins it with a star." Not a few voluntarily make slaves of themselves until they employed machinery, which has no aching bones, no nervous energy to be exhausted, and is never prostrated by fatigue. Even now, vast multitudes of farmers work too much; they do so because there is so much to be done—because so many persons shirk the yoke of labor, and seek ignoble ease in kid gloves and silk stockings, and the task of toil falls unequally upon the industrious.

It is a common saying, crystallized into a proverb, that the work of woman is never done. Half the women in the world are household drudges. We are paradoxical creatures. One class of men make dolls of their daughters, and seem to think the chief object of life is to teach them how to make lambs and lions lie down peacefully in the millennium of their worsted work; another class run to the opposite extreme, and, to use the mildest form of speech, permit them to made slaves of themselves.

On Monday the woman must wash, and draw the water from a deep well or distant spring, when a few dollars would put a pump in the house. On Tuesday she must iron, on Wednesday she must churn, on Thursday she must bake, on Friday she must sew, on Saturday she must patch, and on Sunday she must stay at home and take care of the children.

Now, these labors must be performed by somebody, but they can be lightened and abridged so that labor will be a pleasure as well as a duty—so that "toil will evolve happiness, as a flower exhales perfume." Let the ornamental and the useful be united in the education of girls. Let them play on the wash-tub and the piano, thread the meadows and the needle, make beds of flowers as well as beds of feathers.

Pudding Sauce.—Half a pound of sugar and a quarter of a pound of butter, rubbed to a cream; the rind and juice of a lemon, or any flavor preferred, or brandy wine.

A most ridiculous habit among some young people is the cultivation of melancholy as an interesting accomplishment.

The Weeder.

"The servant earnestly desireth the shadow."—Job.

"The morn is past, and yet the weeds are thick,
And the fierce August sun pours on me burningly.
Oh, God!" she said, "send, send that shadow quick,
Which I desire so yearningly.

"For me the heat and burden of the day,
And a stern master who doth show no lenity;
For him rich pleasure-lands stretch far away,
With groves of cool serenity.

"Above his meadows, into golden air,
The rounded knoll uplifts its green protuberance,
The ripening harvests wave and toss their hair,
In golden-tressed exuberance.

"There are cool woodlands in whose dusk arcades
The very noonday seems of twilight emulous;
No heat wins there, but, in the silent glades,
The silent dews hang tremulous.

"There the tall tulip crests the glorious scene.
The stately monarch of those sylvan palaces;
And its strong arms, like priests in ferial green,
Lift up their golden chalices.

"Through the thick leaves the tempered sunbeams sift,
And pleasant shades are o'er the swards distributed;
There worms may crawl; there thistle-down may drift;
And I—I am prohibited.

"I faint with toil; yet keep my faith to all,
Though none save God, regardeth me observantly.
Father!" she cried, "when will that shadow fall,
For which I pine so fervently?"

Then came a shadow; but 'twas icy cold,
As of some swart, dread angel o'er her hovering;
It wreathed around her with voluminous fold,
And wrapped her in its covering.

Chill though it was, she hailed it with a smile,
And, worn by years and grief and long infirmity;
Lay down beneath it, slept a little while,
And wakened in eternity.

Starching Muslin Curtains.—Noticing an inquiry in a late number of the *Rural*, for the best method of starching muslin curtains, I have taken the liberty to send the following: Wash the curtains clean, and dry them; prepare your starch in the usual way, not having it too thick; wet the curtains in clear cold water, wring them dry, starch them, and if you have a good clean carpet in your house, spread them upon it; pin them smoothly all around, and let them dry. Curtains cleaned this way need no ironing, and look much better than in the usual way. I have tried it and know.—MAGGIE, *Palmyra, N. Y.*, 1861.—[*Rural New Yorker.*

Field Poetry.

For the Ohio Cultivator.

The Poet's Charge to the Birds.

BY THE EDITOR OF FIELD NOTES.

This autumn sunshine hath a royal glow,
As flooding down upon these grand old oaks
And tinted leaves of maple and of ash,
It minds me of the ripened wines, which stir
The slumbrous blood and prick the latent thought,
That has been well nigh overslaughed of late
By the rude chances of a toiling year.
And such a year! God never gave so grand,
So bad, so bustling, wrangling, praying, vile,
Heart-schooling year, of all the years our land
Hath ever seen or may see.

But this sun
Of the ripe autumn time hath lured me out
To field and forest ramble, and to-day
I wake as from a nightmare dream of months,
And while the city bells ring out their calls
For men to gather to the house of prayer,
In meet and holy worship, I shall choose
A rustic seat amid these drifting leaves,
And bow me here to worship and commune
With the All Father.

But even here, as there,
The gay surroundings catch the willing thought,
And toss it round as children toss their balls;
So much hath circumstance to answer for.
Here come a troop of babbling birds, whose songs
Are not the minstrelsy of summer time,
But the mustering of bands which would away:
So like it is to that when April heard
The stern, wild call to arms! when springing up
From half a century of profoundest peace,
Men clutched the arms which had been but their toys
And hied them to the harvest fields of death!

O! is it thus ye call, sweet babbling birds?
Have half your tribes sprang up in mad revolt,
And hurled their fierce defiance in your beaks?
No, no! These leaves in frost-tipped garniture
Betoken the coming of the darkling days
In this our northern clime, when houseless folk
Should seek the solace of a kindlier home:
And your secession shall not treason be,
Nor will they mark you contraband of war.

Heavens! what a scheme! Go to! I have it now!
For since nor word of pen nor printed page
May go from us to them, or come to us,
Save stealthily, like as a thief by night—
I have a message for ye, babbling birds—
A message for the far off ones who dwell
Along the sounding Gulf—on Texan plains—
Where sweeps Savannah and the Cumberland.
Under magnolias and the orange groves
Be those whom I have met and learned to love;
Men whose high blood hath magnetised my palm,
And whose frank confidence hath won my heart:
Aye! more and better, women too there are,
Who ever greet me in a queenly sort,
Spiced with the sweeter courtesies of life.
Fair are the daughters of that goodly land,
As I have seen them in their goodly homes;
The rich red blood athrob in all their veins,
Ripened like tropic fruits by ardent suns.
Full bosomed like the glorious harvest moon,
What time she waits o'er anxious husbandmen,
To give assurance of rich garners full;
Nor over-shy to hide such wealth of form,
As if ashamed that they were women born,
In the full measure of the sex they are,
Instead of pulseless things like garden stocks.
And ye will go to such as these, sweet birds—
Will sing your songs beneath their sheltering eaves,
And while we shiver in the northern blasts,
Will make their winter jocund with your lays.

Well, go! and when ye see mine ancient friend
'Mid his broad-acred Alabama home,
Mind him from me how but one year agone
We bowed together in Mount Vernon's shade,
And crossed our palms before that awful tomb!
And tell my Georgian damsel, ye have met
Her partner in the merry dance that day
We wove a social web of strangest cloth—
Commingling warp and woof from Texan rude,
With the best blood of old Virginia's side;
While crinoline of Alabama belles
Swayed in the arms of Buckeye commoner.

Tell them of these; for O! it cannot be,
They have so soon and cruelly forgot
The better years of such a life and love.
And birds! I charge ye as ye love a friend
Who holds the ægis of the law above
Your helpless callow broods— bring me again
True answers to the messages I send,
When spring shall deck again these lovely groves,
And bid ye welcome to your last year's nests.

Columbus, Oct., 1861.

Chester White Pigs.

THE SUBSCRIBER HAVING ENLISTED for the war, would like to close out his large and superior stock of Chester White Pigs, at wholesale or retail. Pigs of any age shipped to order, to any part of the country, on receipt of pay in cash or merchantable wheat at market price. Also a few Suffolk pigs and South Down Bucks. Address as heretofore.

SETH A. BUSHNELL,
f 38-e10.1m Hartford, Trumbull Co., O.

200,000 Peach Trees

AND OTHER FRUIT AND ORNAMENTAL Trees, Grape Vines, Strawberries, &c., for sale the coming Fall and Spring Catalogues will be furnished on application by the middle of August. Peach, Nectarine and Apricot Trees in pots for Orchard Houses. Address ISAAC PULLEN,
f 29-c8 3m. Hightstown, New Jersey.

Peach Seeds.

500 BUSH. PRIME RELIABLE PEACH Seeds for sale by JOHN F. DAIR & CO.,
Seed Store, 40 & 42 Lower Market Street,
f 49-e11.2t Cincinnati, O.

Clover Hulling and Cleaning Machines.

HULLS AND CLEANS FROM THREE to ten bushels of seed per hour. Power required from 4 to 6 horses. Send for a circular containing full description of this recent improved Machine, to the old Manufacturer and Patentee, M. H. MANSFIELD,
f 34-c9-3m Ashland, Ohio.

DISCREPANCY IN PRINT

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MARKETS.

New York Live Stock Market:

For the Week Ending Wednesday Eve'g, Oct. 23.

The supply of beef cattle and live hogs has been very nearly the same for this week, last week, and for the corresponding week last year, and though the receipts of all kinds of animals destined for slaughter are above the average weekly supply for all of last year, there is a sufficient demand to absorb about all the stock. Our hotels are pretty well filled with country traders and visitors—more so than at any time for many months past. The increased consumption from this cause, and from the laboring classes engaged manufacturing or forwarding war materials, who are able to consume more meat, together with some demand for shipping, with the naval expedition, have livened up the meat market to a considerable degree, and the prospect is that with about our present receipts prices will brighten up a little as colder weather comes on.

The average is a little better than last week, owing to the general better quality and the slightly better prices on Monday. The closing rates are harly so good as the above quotations, and a few tailing of droves were unsold at sundown. Illinois is sending in much less than the usual proportion for that State, and Kentucky is now forwarding several hundred head weekly, of cattle that are usually kept to a later date, and sent in high condition. Of the 4360 head yarded a Forty-fourth Street. 1216 came from New York State; 1137 from Illinois; 731 from Ohio; 472 from Indiana; 409 from Kentucky.

	This Week.	*Last Week.*
Extras	None in.	None in.
First quality	8½@8¾c.	8½@8¾c.
Medium to good	7½@8¼c.	7 @ 8c.
Poor quality	6¼@6½c.	6 @6½c.
Poorest quality	5½@6c.	5 @5½c.
General selling prices	6½@8c.	6½@7¾c.
Average of all sales	7 @7¼c.	7c

New York Market.

Breadstuffs—Flour, good demand for export and home consumption, and also fair inquiry for forward delivery; $5.50 to 5.55 for superfine Western; $5.80 to 5.95 for common to medium extra Western; $5.95 to 6.00 for shipping brands and extra round-hoop Ohio, and $6.10 to $6.50 for trade brands—the market closing firm.

Wheat—Winter red Western, $1.30 to 1.32; white Kentucky at $1.40 to 1.45; white Western at $1.40 to 1.46.

Butter—Firmer; sales of Ohio at 8 to 12c.

Cleveland Market.

Flour—Sale of 100 bbls. choice red wheat double extra at $4.87½.

Wheat—Dull. Shippers offered 95c only, while holders demand 97c, free on board. Th only sales were 2 cars on track at 97c; 1 do at 98c, and 4 cars white on track at $1.

Corn—On track at 32 and 33c.

Oats—Quiet at 25c.

Butter—Choice W. R. for city use is worth 10c. Good central brings 8c.

Dried Apples—Are firm at 5c.

Cincinnati Produce Market.

Flour—There is a continued good feeling amongst holders, but the demand was not very pressing. Superfine $4.25, extra and family at $4.30 to 4.50.

Wheat—The views of wheat operators were somewhat varied as to the condition of the market. Strictly prime grades of both red and white were taken readily, but other qualities were neglected.

Corn—Buyers not inclined to pay over 29c.

Oats—Are firmer, and held mostly at 26½c.

Rye—Is in request, and cannot be bought at less than 42c.

Barley—Ranges from 45 to 50c. The latter is easily had for prime quality.